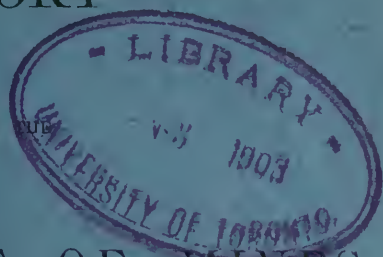


REPORT

OF THE



DEPARTMENT OF MINES,

NOVA SCOTIA,

For the Year ending 30th September, 1901.



HALIFAX, N. S.:

COMMISSIONER OF PUBLIC WORKS AND MINES, KING'S PRINTER.

1902.

T. C. ALLEN & Co., PRINTERS, HALIFAX, N. S.



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# DEPARTMENT OF MINES.

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## REPORT FOR THE YEAR ENDED SEPTEMBER 30, 1901.

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*To His Honour* THE HONOURABLE ALFRED GILPIN JONES,  
*Member of the King's Privy Council for Canada,*  
*Lieutenant-Governor of Nova Scotia, &c., &c.*

MAY IT PLEASE YOUR HONOUR,—

I respectfully present herewith to Your Honour the Annual Report of the Inspector of Mines, containing an account of the progress of mining operations, together with statistical information compiled by him from official and other returns.

I am,

Your Honour's obedient servant,

A. DRYSDALE,  
*Commissioner of Public Works and Mines.*

HALIFAX, *January 2, 1902.*





# REPORT

## ON THE

# MINES OF NOVA SCOTIA.

BY EDWIN GILPIN JR., A. M., LL.D.

FELLOW OF THE ROYAL SOCIETY OF CANADA, ETC., ETC.

OFFICE OF INSPECTOR OF MINES,  
HALIFAX, *December 28th, 1901.*

TO THE HONOURABLE

A. DRYSDALE, M. P. P., M. E. C.,

*Commissioner of Public Works and Mines:—*

Sir,—I beg leave to submit the following report on the Mines of Nova Scotia.

The following summary shows, so far as I have been able to learn the mineral production of Nova Scotia for the year ending September 30th, compared with that for the year ending September 30th, 1900.

	Year ending Sept. 30, 1900.	Year ending Sept. 30, 1901.
Gold . . . . . oz	30,399	30,537
Iron Ore* . . . . . Tons	15,507	419,567
Manganese Ore† . . . . . "	8	10
Coal raised† . . . . . "	3,238,245	3,625,365
Coke made† . . . . . "	62,000	120,000
Gypsum†† . . . . . "	122,281	135,637
Grindstones, etc . . . . . "	56,500	315
Limestone† . . . . . "	50,000	95,794
Barytes . . . . . "	783	600
Tripoli and Silica . . . . . "	1,100	800
Copper Ore . . . . . "	600	
Pig Iron . . . . . "		90,034

\* Including imported ore.

† ton of 2,240 lbs.

‡ Amount exported.

NOTE—Further details will be found in the tables at end of report.

Statement showing Amounts and sources of Revenue received by  
Mines Department during Year ended September 30th, 1901.

Rents .....	\$ 5938 00
License to Search .....	17160 00
Coal Royalty .....	367925 46
Gold Rentals .....	7709 00
Gold Royalty .....	10997 61
Rentals other than Gold or Silver .....	11100 00
Leases " " .....	4150 00
Pros. Licenses .....	11639 00
	<hr/>
	\$436619 07
Fees .....	1107 71
	<hr/>
	\$437726 78
Less amount at the rate of $6\frac{1}{4}$ cents in each ton of coal consumed in the manufacture of Iron and Steel in Nova Scotia paid to the Dominion Iron and Steel Company, August 16, 1901.....	\$2630 44

During the past year surveys have been made in a number of the gold mining districts. Much difficulty has been experienced in getting the necessary surveys for the issue of coal and other leases. The number of available Crown Land Surveyors is comparatively limited. They are largely employed in surveying work which pays them better than Government work at the rates allowed.

The collection of minerals referred to as forwarded to the Paris Exhibition, was transferred with the other Canadian minerals exhibits to the Glasgow Exhibition. At the close of this Exhibition, at the request of the Dominion Government, the Nova Scotia minerals, with the exception of some gold ores, will be placed in the Canadian Department of the Imperial Institute, London.

Work has been continued in the Museum during the past year, and the classification and arrangement of the materials has been continued. During the coming summer a full and complete set of Nova Scotia minerals will be collected and installed, as it was found better to let the collection sent to Paris and Glasgow, remain in London. When this is accomplished the Museum will furnish a good and representative exhibition of the natural products of the Province, which cannot fail to be of interest and value to parties desirous of information about our natural resources.

The Science Library has now been installed and arranged in an appropriate room with facilities for reading and consultation. It combines the libraries of the Nova Scotia Institute, the Nova Scotia Mining Society, and the technical works of the Legislative Library.

In addition to this, the Legislative grant has enabled the department to provide it with a number of books of reference. Judging from the progress made, in a few years this library will become one of the most useful science reference libraries in Canada. Mr. Piers has prepared a report on the Museum and Library, which will be printed.

The Library is already utilised to a considerable extent by those engaged in the study of our resources, natural history, etc.

The usual examinations have been held for granting certificates to Managers, Underground Managers and Miners. It was found impossible to arrange for an examination for granting certificates to Mechanical, Engineers. The following list gives the names of those receiving certificates as Managers, etc. :

#### CERTIFICATES GRANTED AUGUST 20TH, 1901.

Johnson, John,	Port, Hood,	Manager.
Quigley, Jos.,	Broad, Cove,	"
Cassidy, John,	Westville,	Foreman.
McPherson, Wm. A.,	Springhill,	"
McPherson, Jas. E.,	"	"
Langille, Bert.,	"	"
Fox, Herbert,	"	"
Moss, Joseph,	"	"
Scott, Jas.,	"	"
Brace, John,	"	"
Stewart, Alexr.,	Joggins,	"
Davison, J. W.,	Glace Bay,	"
Jardine, Duncan,	Sydney Mines,	"
Tobin, William,	"	"
McLeod, Joseph,	Dominion No. 1.	"
Lauchlan, Robert,	Westville,	Under Manager.
Brown, John M.,	"	"
Henderson, James,	"	"
Morrison, Dan.,	"	"
McKenzie, Jas. G.,	"	"
Stewart, Thos.,	Stellarton,	"
Welsh, Moses,	Springhill,	"
McLeod, Alex. K.,	"	"
McNeil, Alex. S.,	Dominion No 1	"
Lynch, Andrew	Caledonia Mines,	"
Welton, Richard	"	"
Lind, Edw. A.,	Reserve Mines,	"

Much interest was taken in the arbitration between the Dominion Coal Company and some of their employees. This arbitration was held under the Miners' Arbitration Act. I give at the end of the report the finding of the arbitrators and the report of Mr. Justice

Graham, the chairman of the Board. Difficulties between the Nova Scotia Steel and Coal Company, were reported to have been settled under the provisions of a Dominion Act bearing on arbitration.

It is sincerely to be hoped that in future arbitration will always be resorted to when differences arise between masters and men.

The losses inflicted on both sides by strikes and lockouts are felt not only by the parties directly interested, but their effects are widespread on the community in which they occur, and on the general public. The collection, exploitation and preservation of capital form the basis of industrial advancement. The capitalist and the workman are equally dependent on the public opinion and judgment which provides the means of opening mines, building mills, railways, etc.

The Department has one steam diamond drill, two hand diamond drills, and two calyx drills. These drills have been used at Torbrook, Annapolis County, at Westville, Pictou County, at Hantsport and Kennetcook, Hants County, and at Whycocomagh, North Sydney, and Lingan Basin in the Island of Cape Breton. Further details under this head will be found in a report from Mr. Weatherbe.

## COAL TRADE.

The returns of coal sold during the year 1901 show, when compared with those of the year 1900, as follows:

	1900	1901
Nova Scotia .....	863,900	998,814
New Brunswick .....	406,519	349,994
P.E. Island .....	68,103	53,773
Newfoundland .....	99,307	105,620
Quebec .....	934,229	1,017,046
West Indies .....		
United States .....	624,273	590,086
Other Countries .....	1,215	4,002

The production was 3,625,365 tons compared with 3,238,245 tons in the year 1900.

The total sales were 3,119,335 tons compared with 2,997,546 tons during the preceding year.

The sales show no marked changes. The Nova Scotia sales are increased by the operations of the Dominion Iron and Steel Company. The sales to Quebec show a slight increase, and those to the United States have fallen off a little. A small shipment has been made to Europe, and statements are made that there is a good opening for Nova Scotia coal in Northern Europe and at some points in the Mediterranean.

### CUMBERLAND COUNTY.

During the year the production was 478,226 tons compared with 496,804 tons during the year 1900. The Springhill Collieries raised 410,440 tons, and the Joggins Mines raised 66,065 tons.

### PICTOU COUNTY.

This County produced last year 490,168 tons against 538,884 tons in 1900. The Acadia Company raised 271,145 tons, and the Intercolonial Company raised 219,023 tons. During the summer the Nova Scotia Steel and Coal Company opened a Colliery on one of the seams of the Marsh group between New Glasgow and Thorburn. By an



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arrangement with the Acadia Coal Company the seam will be worked on the areas of both Companies from the same slope. During the coming season this Colliery is expected to produce about 200 tons a day. It is stated that the coal will not be placed on the market, but will be mined for use at the steel works, as it is stated to be particularly adapted for use in the convertors.

The following report by Mr. Cameron on the operations in Pictou and Cumberland will give details for the different collieries in those counties :—

SPRINGHILL, Nov. 4th, 1901.

E. GILPIN, ESQ.,

*Deputy Commissioner and Inspector of Mines.*

SIR :—I have the honor to submit to you herewith a report on the various mines in the districts of Pictou and Cumberland Counties for the year ending September 30th, 1901.

DRUMMOND COLLIERY, PICTOU COUNTY.

NOS. 1 AND 2 SLOPES.

This mine is at present worked through three lifts known as Nos. 12, 13 and 14. In the former the coal is all won except a pillar 40 feet by 200 feet. When this is extracted, the lift will be closed. The south levels of No. 13 have been extended a distance of 3504 feet. Nos. 1 and 10 balances were driven. The latter has been practically worked out, and the former has just been put through to the lift above. The north levels of this lift have been driven to the boundary 3,056 feet.

Nos. 1 and 4 balances have cut through, and 5, 6 and 7 are being driven. The levels of No. 14 lift have been extended north and south during the year. Nos. 3 and 4 balances have been turned away on the north side, while No. 1 balance is being driven on the south side. The No. 2 slope is being driven up through this lift. The fan shaft which is 325 feet deep, and is sunk to the No. 5 level is having its area enlarged from 68 to 108 square feet. This work began in March last and is about completed. The airways in this mine have been enlarged and repaired, and the ventilation is good.

SCOTT PIT.

In this mine work was continued on the Nos. 1, 2 and 3 lifts. On the No. 1 lift, No. 2 and No. 3 balances were extended on the bords, and No. 1 was well advanced. Early in January, 1901, work in this mine was totally suspended.

## NO. 4 SLOPE.

The pillars in this slope referred to in Mr Blue's report of last year were all extracted. No. 1 lift was opened out, and a number of pillars taken out. On No. 4 lift the levels were cleaned up, and retimbered, and balances driven in order to effect the removal of several pillars. A pair of slants were driven south near the bottom of the slope, and bords were driven on each side of the slants, and several pillars taken out. The old Findlay incline and level below has been cleaned up and retimbered for 500 feet. An opening into some of the pillars of the north incline, in a few places has driven into a large block of coal. This mine has been put in a thorough state of repair, and the ventilation is good.

## ACADIA MINES, WESTVILLE.

During the past year the coal in No. 9 lift has been worked out, and at present the coal is being taken from No. 10 lift. On the south side, the coal at the boundary, and along the waste to the rise, is being steadily withdrawn toward the slope. The inside plane-way known as No. 10 is worked out, and at present 6 planeways outside of this one are being worked. A block of coal 1,500 by 325 feet. between the slopes and the present works remains to be taken out. On the north side the coal along the fault is nearly all extracted, as well as a large portion to the rise. There still remains on this side a block of coal 700 feet by 300 feet near the slope, and a pillar of coal 1,200 feet by 70 feet next the level.

Preparations are being made to sink No. 11 lift, and a commerce-ment will be made in a few weeks. The distance from the main slope to the sinking slope is a little more than twice the former distance, and this will allow for larger sidings at the new slope bottom. The return airways have been considerably improved, and the ventilation is fair. On the surface a number of improvements have been made. A new carpenter's shop has been built, and now the blacksmith's, machine and carpenter's shops are under one roof. When the changes contemplated on the surface are carried out, the above ground plant will be largely renovated.

## ALBION MINES, STELLARTON, N. S.

## NO. 2. SLOPE.

Early in July the main bottom was moved further down, the length of the new level being 900 feet. On the levels going west, at a distance of 1,452 feet from the new bottom a stone drift has been driven connecting with the third seam and the deep seam coal which is not taken out from this drift. This drift enters near the new bottom in the third seam. The length of the levels in the deep seam through the stone drift from the working face is 3,168 feet. In the deep seam there are two balances working, two balances are ready

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for work, and three driving up. The coal is of good quality in this section of the mine. The level in the third seam from the new bottom to the working face is in a distance of 3,630 feet, and there are no balances turned away. The coal continues good. The levels going east in the third seam have been standing for a few years owing to fire damp. The length of these levels to the working face is 990 feet. These levels were started again on August 24th, and a balance turned away close to the working face.

There is a pit called the Stapple Pit, 150 feet from the new bottom on the east side. This pit, 120 feet, connects the third seam with the deep seam. The coal is dropped from the deep seam to the third seam by means of a counter balance on the same principle as the ordinary back balance. Through this shaft two full boxes can be dropped in one minute.

On the west side the length of the levels in the deep seam from the Stapple Pit to the working face is 1,848 feet. There are two balances driven up ready for work. One driving up. On the east side of the Stapple Pit to the working face the old levels are in 2,376 feet. These levels will be worked connected with the English slope, which will be used as an intake airway.

There are two balances working on the east side. No. 6 balance on the west side is finished, except four stumps, 40 by 47 feet.

No. 5 balance on the west side of the old bottom is still working, and the coal is lowered to the new bottom by an incline.

#### ALBION MINES.

##### NO. 1 SLOPE.

This slope was abandoned a number of years ago owing to a severe explosion. It is being re-opened again. It is now cleaned and timbered and built down to the No. 2 landing. There are still four stopings to go in to complete the job. Heavy falls were encountered in cleaning up the slope, but no indications of fire or heat have been noticed as far as the work has progressed. This slope, when finished, will be used as an airway, riding slope and for lowering timber. No. 2 slope will be used entirely for hoisting coal.

#### MARSH COLLIERY.

This property is owned by the Nova Scotia Steel and Coal Co. of New Glasgow, who have held these leases for years past. But owing to the difficulty of getting coal to suit their purposes and knowing that the Marsh areas contained coal of gas producing qualities, having proved it so by actual trials, they decided last fall to develop the seam known as the George McKay or Four Foot Seam, and



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with that object in view began testing their areas by trial shafts, and after carefully going over the field they decided to sink a pair of slopes in the most convenient place, which is about four miles east of New Glasgow, and two miles west of Thorburn, and on the Sherbrook Road, and on the 1st of April broke ground for the slopes, and on the 1st of May let the sinking of the two slopes by contract, and as the company decided not to work the top or surface lift of 500' at this time, it was necessary to sink the slope to the second lift before turning off the working levels, which they did at 875 feet, and a further distance of 83 feet were sunk for water lodgement, making in all 958 feet of slope sinking through new and wet ground in five months without any delays or accidents of any kind.

They are now putting down sills for the permanent hoisting track, and connecting the track on the bankhead to the tippie and will be completed in a few days, and then will be ready to ship coal to the N. S. Steel and Coal Company at Trenton, who is to be the only consumer, and will require from 250 to 300 tons per day for their own use.

This coal will be taken to New Glasgow by the Acadia Coal Co. on the Vale Colliery Railway, thence by I. C. R. to Trenton.

This colliery is connected to the Vale Colliery Railroad by a siding 2,100 feet long, which is all graded and complete.

Buildings for all necessary purposes are now completed; blacksmith, carpenter's and repair shops under one roof and conveniently located.

The buildings for the hoisting engine and compressor are closely located to the boiler house. The bankhead house is finished; it is low in the post compared to other collieries; this is due to the fact that the Company takes all their coal run of mine, and don't require screens.

An office, magazine, fan house, stables and wash house for men to change, are all completed. The buildings are all covered on the roof with heavy felt covered with tar and sand, the walls with steel sheets stamped to represent brick and gives a very neat appearance. The machinery consists of a hoisting engine  $12\frac{1}{4} \times 15''$ , made by S. Floy & Co., of Bangor, Pa., and is off the Ledgerwood pattern, with double drum friction gear, friction brakes.

The compressor for pumping and mining machines and all underground haulage is made by the Canadian Rand Drill Co., the size  $13''$  and  $21'' \times 36''$  being compound steam corliss valve gear and compound air.

The boilers consist of a pair made by I. Matheson & Co., of New Glasgow, they are the multitubular  $5\frac{1}{2} \times 16'$ . The fan engine, made

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by the Robb, Armstrong Co., 8" x 9" high, speed automatic, oilings of latest design. The fan has a capacity of 30,000 cubic feet per minute.

The pump is 6" x 7" Duplex Northy, and though a considerable amount of water has been encountered, this pump handled it all without any trouble. The work to this date is by an upright boiler tubular 4' x 8½', an engine 8" x 12," of the S. Floy make. The boilers are now built in and ready for duty. The foundations for the engine and compressor are completed; they are built of concrete and look fine, and are ready for the machinery, which is on the ground and are ready to be installed.

The company are finishing nine cottages for their employees, and intend to build quite a number in the spring.

John W. Sutherland, *Manager*.

W. A. Sutherland, *U. G. Manager*.

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#### MCGREGOR PIT, STELLARTON.

Very little work has been done in this mine. A pipe bord is being driven 6 by 6 feet. On the surface at the Albion Mines a large machine shop has been built close to No. 2 slope, and the machinery removed from the Foord Pit to these works.

#### VALE COLLIERY.

This colliery is on a 6 foot seam which dips to the north at an average angle of 16 degrees, the coal being hoisted from a slope 2,800 feet in length. From the bottom of this slope the main levels turn off almost due east and west. On the west side, practically no development has been made during the year. On the north seam work has been done during the past three months with a view of opening up more coal; but nearly the entire output of coal comes from the east side workings. These levels have been extended 1,000 feet. No pillars in this mine have yet been drawn. During the past 4 months, the surface plant has been practically reconstructed, and put in condition capable of handling twice the present outcrop. In the mine a new stable has been built, to receive 15 horses. The mine engine has been changed from the double rope key drum system to a single rope and a roof drum operated by a clutch and brake. By this means one track only is used, and the trips are enabled to reach the lower levels without danger of stopping on the flat portions of the seam. Before, the trip consisted of 5 boxes, but now 6 are being hoisted. On the surface to the east of the present engine house, a new plant of 2,200 H. P. Sterling boilers was erected. On the bankhead, a 600 ton capacity picking table has been erected, and furnished with a chute for loading box cars.

Although this mine is comparatively free from gas, the management, with the approval of the department, introduced the use of safety lamps throughout the pit last July.

#### JOGGINS MINES.

##### NO. 2 SLOPE.

At the bottom of the landing going west, the levels have been driven a distance of 500 feet in clean coal; and to the east, the levels are in a distance of 1,450 feet from the slope. At 400 feet from the slope on the east side, a downthrow of 18 feet was met, and successfully cut through. 700 feet further in a second fault was met, and cut through, which threw the coal up about 15 feet. The levels are now about 300 feet beyond this point. The thick clay is normal, with the exception of the west level, where it has lately reached a thickness of about  $3\frac{1}{2}$  feet. The coal in these levels is of very good quality. The Company have started sinking this slope and expect to go down for a new lift of 600 feet. The coal in these levels is working, and is being hauled by a coachway system which gives a quick and satisfactory production of coal.

#### JOGGINS MINES.

##### NO. 3 SLOPE.

The levels have been advanced between 350 and 500 feet on each side of the slope. On the east side they have reached that part of the seam in which there is a thick belt of clay, on which the upper workings are standing. The intention of the company is to persevere in driving the eastern level to prove if the thickness of this belt diminishes.

All the boilers were thoroughly overhauled and two new boilers added, which were made at No. 2 slope. The ventilation at this mine was moderate.

#### MINUDIE MINE.

This mine has been working continuously during the year. The slope is 5 feet by 10 feet. The first level, 70 feet from the top of the slope is in 120 feet to the face. The level going eastward, is driven 82 feet to the face, at a distance of 209 feet from the top of the slope. There is another level driven east 684 feet. There are no workings to the westward at this point, on account of the old workings which are not more than 600 feet distant, and full of water. A steam pump has been provided to take the water out of the mine, and a new hoisting engine has been installed with a new rope. Sinking operations began in July, and this slope is now down about 600 feet. The property has been operated by M. M. Sterns for the past two years but changed hands last autumn, and is now to be known as the Minudie Coal Company, Limited. The new Company intends

putting in a 200 ton per day plant, which they expect to have working at an early date. At present the capacity of the small slope being worked is in the vicinity of 40 tons a day.

#### STRATHCONA COLLIERY.

WM. HALL, MANAGER.

This Company is working what were known as the Milner areas at River Hebert. They have cleaned out all the old slope, and have retimbered down to the water level, a distance of about 80 feet; and intend to sink to a depth of 1,000 feet. They are now building carpenter's, blacksmith's shops, and offices, and are preparing the foundation for an engine house; and expect to be able in the spring to make a good shipment of coal.

#### SCOTIA MINE.

This is a new slope sunk to a depth of about 100 feet with levels driving east and west. 6 to 8 men are employed along the western crop taking out coal. The ventilation is moderate for the mine, at present, but will require to be materially increased if a larger output is aimed at.

#### SMITH'S MINE.

During the first part of the year, Mr. G. J. Harrison employed from 6 to 15 men in this mine. The slope has been driven down about 300 feet, and the coal worked up hill by longwall system. The working of this mine was abandoned last July.

#### JUBILEE OR MICMAC MINE.

This mine has been leased by Mr. J. H. Patrick who employed from 6 to 20 men the first part of the year. The present levels were extended a short distance east and west. The slope was sunk a distance of 90 feet, and levels turned off. The workings in this seam which is about 2 feet thick, have been practically suspended since July.

#### CHIGNECTO MINE.

But little work has been done here this year beyond the employment of several men in prospecting work. This property changed hands in July, and the new owners propose to operate it, and equip it with up-to-date machinery; and they expect to do a large business.

#### SPRINGHILL MINES.

##### NO. 1 SLOPE.

In giving an outline of the work done during the year, I may say that very little has been done at this seam, except a continuation in pillar work below the 1,300 feet level.



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NO. 2 SLOPE.

In this slope a great deal of work has been done. The west levels have been extended 990 feet making their total line 5,676 feet. In Mr. Blue's last report, mention was made of the coal having been struck on September 20th in the Aberdeen tunnel. Since that date 380 feet of narrow work has been driven to the rise with boreholes well advanced up to 67 feet until the Aberdeen workings were struck.

After piercing the workings, 6 million gallons of water were pumped before an opening could be made into the old workings. This was effected on February 10th.

The level going east from the fault has been extended 1,708 feet and going west it has been driven 725 feet back to the Aberdeen fault, with 3 balances driven to the rise.

It was found that the Aberdeen slope had fallen very heavily, and that it was dangerous to timber it from below. It was therefore deemed advisable to clean up and timber it from the surface. This necessitated a bankhead, and 1,100 feet of branch line from the Springhill and Junction road; 270 feet of the upper slope was laid with sills cross-wise, and 3½ inch rails. A locomotive was used to bring up all the stone and to lower the timber; and up to date 1,170 boxes of stone, and 750 feet of the slope has been made permanent. This will be used as a road for the east workings, and for sinking purposes. Levels have also been extended in the upper and lower seams eastwardly from the fault. In the former the levels were driven 1,402 feet making their total line 2,180 feet; and the latter are in a total distance of 1,630 feet.

The tunnel through the underlying seams started on the west side has received a fair share of attention during the year, as 284 feet were driven, making a total distance of 993 feet. In this cross tunnel several small seams have been struck. On the surface 4 new double flued boilers 30 feet by 5 feet were placed in position, relieving the old ones recently taken out. All the boilers are equipped with Crosby spring safety valves of the most improved type; 2 other boilers were purchased, and are now ready to be placed in position. The winding engine at this slope was repaired with new drum shaft, drum cistern feed, cast steel pinion etc., and is now in first class working condition.

## NO. 3 SLOPE.

■ In this slope the extraction of pillars in the 1,900 feet levels east and west was continued until the end of June when the levels were abandoned, and connections made with the 2,600 feet level.

During the year, this level was extended west for a total length of 9,528 feet. The 3,200 feet level was extended for a distance of 6,899 feet, and on the east bottom seam, a distance of 2,315 feet was reached from the slope.

The main slope seam was commenced in January, and it has been sunk 630 feet, the levels being turned off, and the fanway and pipe bord nearly completed. The fanway, pipe board and east and west returns have also received a fair share of attention. At this slope two new double flued boilers 30 feet by 5 feet have been placed in position making a battery of 12 boilers, all having been equipped with improved valves. In the case of No. 2 slope boilers a new chimney 4 by 6 feet wide, and 8 by 5 feet high has been placed on a brick base, making the total height of the chimney 100 feet. A complete set of mechanical stokers and blowers are in course of erection, and will be completed at an early date.

A foundation for a pair of 30 feet by 48 feet direct acting link receiving hoisting engines has been completed at this slope. The engines are furnished with 2 cast iron drums 6 feet 6 inches in diameter, deep enough to hold 6,000 feet of  $1\frac{1}{4}$  inch rope. The foundation, when finished, will contain 11,000 cubic feet of concrete. The engine will be covered with a brick engine house, and will add greatly to the efficiency of this colliery; 14 double dwelling houses 40 by 24 feet, have been built for the employees. These houses are of a suitable type, and will prove a great accommodation, as the supply of houses at Springhill is comparatively limited.

I may add that at the No. 2 slope the old lamp house having proved unsuitable for the purpose, a new house was built. This building is of brick with slate roof, and of the following dimension:—Full length inside, 60 feet, width 29 feet; height of lamp room, 13 feet. This building accommodates our lamp room, store room, and room used as repair shop, etc., for lamps.

The S. Hill Mines are thoroughly ventilated and great precautions taken for the safety of the workingmen.

In conclusion I may say that the large mines in my district are kept in good order, and the requirements of the Coal Mines Regulation Act are carried out.

I find great difficulty in getting the management of the small collieries in Cumberland County to fulfill the requirements of the Act.

I have the honor to be, Sir,

Your obedient servant,

A. V. CAMERON,

*Deputy Inspector of Mines.*

*Amount of Air Circulating in Mines each Month.*

MINE.	COUNTY.	1901.							
		Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
Springhill, No. 2	Cumberland	79000	74000	74500	70800	68000	67000	69000	70000
“ “ 3	“	82000	84000	80200	74400	75000	76550	76600	75500
Joggins, No. 2	“	11000	14000	13000	12000	14000	12500	13000	14000
“ “ 3	“	Idle	Idle	Idle	9000	95000	8000	8500	75000
Jubilee Mine	“	2-00	2600	2000	Idle	Idle	Idle	1200	Idle
Smith Mine	“	3500	4000	3800	Idle	“	“	“	600
Scotia Mine	“	1200	1100	900	Idle	“	“	“	600
3rd Seam, Stellarton	Pictou	81400	75000	81600	70980	71200	71076	79600	79700
Drummond, No. 4	“	14920	16800	16000	18000	17000	17000	18600	19680
“ “ 2	“	30000	29000	28500	25900	24000	24800	25200	22800
Acadia	“	37200	32000	32700	32600	31200	28000	29000	29000
Vale Colliery	“	19000	18800	17600	17200	17500	16000	16800	17000
River Hibbert	“	7600	7000	6500	6000	6800	7200	7400	7100

## Date of Official Inspection.

MINE.	LOCALITY.	COUNTY.	1901.							
			Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
No. 2 Slope	Springhill.	Cumberland.	14	6	9	6	8	16	26	22
No. 3 "	"	"	15	5	8	7	10	17	27	23
No. 2 "	Joggins.	"	7	12	11	10	7	4	16	17
No. 3 "	"	"	Idle	Idle	Idle	11	7	4	16	17
River Hibbert Mine	River Hibbert	"	8	12	12	9	6	7	15	18
Jubilee Mine	Maccan	"	8	13	11	9	6	3	15	18
Smith Mine	"	"	11	11	9	6	3	8	15	13
Scotia Mine	Chignecto.	"	16	11	Idle	Idle	"	"	12	13
Chignecto Mine	"	"	16	11	Idle	"	"	"	12	13
Drummond Mine, No. 2 Slope	Westville.	Pictou.	19	19	16	21	17	9	7	4
" " 4 "	"	"	20	20	17	22	18	10	8	5
Acadia Mine	"	"	21	21	18	23	19	9	9	5
Third Seam	Stellarton.	"	22	21	17	22	18	11	8	6
Vale Colliery	Thorburn.	"	23	18	15	24	15	11	7	6
Marsh Mine	"	"	18	18	15	23	15	11	7	6



*Accidents.*

No.	DATE.	MINE.	NAME.	OCCUPATION.	REMARKS.
1	Feb. 28	No. 3 slope, Spr <sup>2</sup> hill.	Frank Furlong.	Laborer.	Fatally injured by being scalded with steam.
3	" "	" "	White and Newall.	"	Slightly " "
4	Mar. 30.	" 2	Chas. Foster.	Loader.	Leg broken and other injuries, being thrown off trolley.
5	April. 26	" 2	Joseph Arsneau.	"	Leg broken by a fall of coal
6	May 18	" "	Fred. Moorhouse.	Driver.	Leg broken by rake jumping track.
7	June 18	" "	Isaac Skidmore.	Loader.	Leg broken by a piece of stone from roof.
8	Aug. 26	" "	James Harrison.	Cutter.	Leg broken by a pot of stone falling from roof.
9	Mar. 21	" 2, Joggins Mines.	Wm Milonson.	"	Burnt with gas in long wall.
10	" "	" "	Chas. Holmes.	"	
11	" "	" "	Placid Gould.	"	
12	May 29	Drummond P. C.	Chas. Cey.	Loader.	Slightly hurt; caught between box and boom.
13	June 3	" Pietou.	Chas. Wilson.	Laborer.	Injured about the head on bankhead.
14	May 31	" "	Angus Sinclair.	Trapper.	Collar bone broken uncoupling rake of boxes.
15	June 15	" "	Alex. G. Wilson.	Miner.	Ankle dislocated by a fall of top coal.
16	" 7	" "	John Wright	"	Collar bone broken; caught between box and rib.
17	July 22	" "	John W. Burney.	"	Killed by a fall of top coal and stone.
18	Aug. 26	" "	J. W. McMillan.	"	Killed by a fall of coal and stone.
19	April 25	Acadia, Picou.	Michael McDonald.	"	Slightly injured; caught by passing rake.
20	June 15	" "	Daniel Carrigan.	Boy.	Both legs broken jumping off riding rake.
21	" 20	Albion Mines.	Michael Martin.	Engineman.	Fatally injured; whirled around a shaft.
22	" 13	Vale Colliery.	James Smith.	Driver.	Fatally injured; crushed between box and rib.

## CAPE BRETON COUNTY.

The sales from this county were 2,260,955 tons against 2,041,806, tons in 1900. The production of the Dominion Coal Company was 2,352,567 tons as compared with 1,930,425 tons in 1900.

The sales in Nova Scotia which in 1900 were 469,258 tons rose to 631,135 tons last year, due presumably to the increasing demands of the Steel Company.

The Nova Scotia Steel and Coal Company are engaged in enlarging their shipping facilities at North Sydney, and in carrying out improvements at their Colliery. The underlying seam it is reported will be opened on a large scale.

The Dominion Coal Company are opening out their workings on the Harbor and Phalen seams in the No. 2 shafts. The slope on the Emery seam has been discontinued owing to the thinning of the seam. The introduction of Electric underground haulage at the Dominion No. 1 Colliery marks a new departure in coal mining methods in Nova Scotia.

The Gowrie and Block House Collieries have continued their deeps and have broken off rooms to the rise.

The diamond drill of the department bored three holes across the strata at Pottle's Lake, in the rear of North Sydney, but no coal was struck. In the fall Mr. McVey used one of the hand drills and extended the passage of the Lingan Basin seam from the head of the basin towards Grand Lake. I am not aware of any other exploratory work of consequence.

I append the report of Mr. P. Neville, Deputy Inspector, for the Island of Cape Breton.

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REPORT FROM P. NEVILLE.

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BRIDGEPORT, October 29th, 1901.

E. GILPIN, JNR. ESQ.,

*Deputy Commissioner, and Inspector of Mines.*

DEAR SIR,—I beg leave to forward to you a report on the Coal Mines in Cape Breton for the year ending September 30th 1901.

## CALEDONIA.

At this colliery the west deeps have been continued and the levels and narrow places advanced, and rooms worked off. A large section of

pillars has been drawn between No. 2 and No. 3 levels in that district; also to the rise of the west main high level between that and the crop of the coal. The water with which the mine was flooded at the time of the fire has been all pumped out. It was found when the water receded, that all of No. 6 Section east deeps, comprising 1,300 feet of double levels with 44 rooms, some of which were driven up 400 feet, was full of explosive gas, which was successfully removed without the slightest accident. The mine water which, at times, is very heavy on account of the drawing of pillars, is now all taken out with the tanks in the water shaft which has been finished during the past year, and is working very successfully.

A new Rand Compressor has been erected equal in capacity to the one already in operation, so that at present the greater part of the mine is worked by machines, in fact all except the drawing of pillars. The new steel fan built by the Dickson Manufacturing Company of Scranton, Pa. has been constructed, and has a separate engine directly connected, so there is, at all times one fan in reserve, ready to be started at a few minute's notice in case of accident to the one running. A new dynamo was erected giving a very satisfactory lighting on surface and in the pit bottom, needed on account of working day and night. The output of this mine during 24 hours has been as large as 3,250 tons.

#### INTERNATIONAL MINE.

The main deeps have been driven down about 900 feet, and rooms are being driven both east and west, also a new landing made at the bottom of the deeps. The submerged district, No. 11, has had the water pumped out and the ventilation restored and is now working again. The new Northey pump is supplied with water from the feeders that came off where the pillars were taken out in No. 5 and No. 6 districts.

At present new roads are being laid in the main south level, leading directly from the shaft, and it is the intention of the management to extract all the pillars available to the rise of the point where the feeders were met last year. The district known as No. 2 has been on pillar working since my last report, and every pillar taken cleaned out and without any accident. Timbering and ventilation have been attended to, and the mine is in good condition.

A temporary engine has been placed on the surface to run the fan during the time the old fan-engine is being repaired at the general machine shop. Two new tubular boilers have been placed on the surface to be in readiness for supplying steam to an underground pump in Dominion No. 1, where it is intended to pump water up from the Phalen seam to the Harbor seam, a distance of 450 feet, delivering the water into an old level running direct to the shore.

A good substantial wash-house has been built for the workmen, and the majority of the men wash and change their clothes in it.

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DOMINION No. 2 COLLIERY.

The Harbor seam was struck at a depth of 410 feet from the surface, and two entries made into it, one on the low side of the shaft and one on the high side, and levels started north and south. They are, up to this date, each extended about 580 feet. At a distance from the pit-bottom of 350 feet north and south, two pairs of deeps have been started and are at present down about 300 feet. The seam here is six feet and a half thick and looks well, the coal proving very satisfactory. This shaft which is called the main shaft 37 feet by 11 feet has been reduced to 21 feet by 11 feet, and has tapped the Phalen seam at a depth of 850 feet from the surface, and a pump sunk 12 feet below the seam. An entry from the east side of the shaft has been driven 40 feet to the deep, and a level driven from that point north to connect with the air shaft which also has reached the coal at a depth of 862 feet 4 inches. The coal here looks well showing no splint or other impurities.

At present the work of timbering the shaft is going on as fast as possible in order to have it completed in about five months from this date. Hard pine 6" x 6" is used in timbering the full size of the shaft and the air partition sealed with 2 inch hard pine. It is quite necessary to have these shafts well timbered, and the walls sealed and made safe as the action of the air on the rock, shaken by the dynamite when sinking, may in course of time loosen it.

The permanent buildings on surface are:—manager's office 45x18 feet 10 foot post, warehouse 57'x20', 10 foot post, horse-stable 78'x32', 10 foot post and shed attached, wash-house for miners 48'x26', 9 foot post, carpenters'-shop 28'x26', 9 foot post, forge and machine shop connected 75'x27', 13 foot post covered in with steel shingles and, also a fire engine-house built of brick and covered with steel shingles. A large store is built 90'x40', 19 ft. 6 in post, a managers' house 41'x28', 16 foot post and 97 double dwelling-houses for the workmen 40'x24', 13 foot post, which are all about finished.

The coal engine hoisting out of the main shaft from the Phalen seam built by Dixon & Co. is a double cylinder 34"x48" and stroke 48", steam pressure 120 lbs. The hoisting engine from the Harbour seam is a Corliss, built by Jenkins & Co. double engine cylinder 24"x36", 36" stroke, size of drums 8 feet. The man-cage engine is also built by Dixon & Co., cylinder 34"x48", stroke 48" steam pressure 120 lbs. The drum is a cone built, 10 feet at each end and 14 in the centre. The fan is a guibal 24 feet in diameter and 9 feet wide. The engine is "corliss" built by Dixon & Co., size of cylinder 20" diameter, stroke 48".

## RESERVE MINE.

Two new compressors built by the Rand Drill Company have been erected, which are giving good satisfaction. They are of the following size, steam 20"x36"x48", air 20"x32"x48".



A new engine has also been set up for driving the rocker and shaker screens and also the picking belts. These are all driven by rope drivage. A new engine 60"x26" has been erected at opposite end of the main shaft of old haulage engine with a clutch which enables one or both to work at same time.

A 24 feet guibal fan is nearly completed near the east slope, about 4000 feet from the bank-head and engine-house, which is to be driven by compressed air. This fan is to ventilate the new slope workings, and the south side of the French slope workings. The old fan is to ventilate the north side of working.

Twenty double blocks were built near east slope for miners 40"x24" and 12 foot post. The main slope was extended down 700 feet and a new landing made. The French slope was extended 1000 feet and a new landing made. The east slope was also extended 1,000 feet, and a new landing made. Levels and headways were driven, in the ordinary way. Stone and brick stopping have been put in to make the necessary change for ventilation when the new fan starts.

#### DOMINION No. 1.

A pair of new haulage engines, which are to take the place of the three now in use, one on surface and two in pit, is placed on surface. The rope is to be driven by grooved wheels instead of the old fashioned bull wheel. A large engine-house has been built over those engines which adds to the appearance of the place.

The foundation for a 24 foot guibal fan is finished. This is to take the place of the two Murphy fan now in use. A 12 inch Robins conveyor belt for carrying the coal to the fire room from the bank-head has also been erected and proved to be a success.

The new shaft spoken of in last year's report has been sunk, and the buntons and spears placed in, also the foundation for the engine is built.

A new wash-house 62"x20', 7½ foot post has been built for the men to wash in. It is lighted with electric light, has hot and cold water and also the building is heated.

A large K. W. dynamo was placed on surface in old haulage engine house which lights a great part of the mine, yard, bank-head and colliery buildings, and also supplies power for locomotives on No. 5 south level in the pit. This works well. This level was railed with heavy rails a distance of 1,400 feet to make it safe for the electric haulage car. Levels and rooms were extended and worked as usual. The angle deep is now being laid with large rails for a new lift of 700 feet.

The 12 foot fan which was disabled by fire July last has been repaired and is as good as new. Twenty new double block houses were built for the miners and streets made between them.

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GOWRIE AND BLOCK-HOUSE.

This mine is doing well, steadily advancing the deeps out under their large sub-marine areas. When this is accomplished and the slope finished the Colliery will assume a different character. The aerial rope way system, mentioned in last year's report, has given entire satisfaction. The rope travels at the rate of five miles an hour, or fast if required, and is guaranteed by the makers to deliver 500 tons in ten hours between the screens and the pier. The shipping pier has been extended 100 feet making in all 201 feet and can stow 800 tons of coal in the pockets. Another 75 horse power tubular boiler with smoke stack has been added to the battery first installed. The second air compressor has been put in place and connected with the first half put down. These two compressors now operate five Ingersoll coal-cutting machines, three Howell No. 2 air drill, two rock-drills and one Northey deep pump and the air for the black-smith's forge.

The surface constructions, bankhead and screens are all in operation.

A shaft is being sunk south of the present shaft, which will be down by the end of December. This shaft is intended for ventilation and to lower and hoist workmen.

In the pit the three main deeps have been driven 1,000 feet each. Short rooms have been broken off from the third or upper deep. The pillars in these deeps are 37 feet by 60 feet long. Very little water is met with in this mine; no heavy feeders. The water is now pumped from the mine by a Jeansville compound duplex pump placed at the pit-bottom instead of being taken out by tanks as stated in last report. The coal has proved to be of good quality as is seen by the steadily increasing demand for it. No serious accident has occurred at this mine since it started.

## SYDNEY MINES. NOVA SCOTIA STEEL AND COAL COMPANY, LTD.

During the year there has not been any material addition to the surface plant at this Colliery. The erection of 30 Bauer coke ovens is completed and the washing plant is rapidly nearing completion. Three Babcock and Wilcox boilers, of 270 horse power each, have been put in at this Colliery. These boilers are to be fired with the gasses from the coke ovens, and will replace a number of the old type of low-pressure boilers now in use. These boilers are to work at a pressure of 125 lbs.

The Colliery, as usual, has worked steadily throughout the whole year. The deeps and levels have been extended and many pillars extracted with very great success. The district of long wall work on the north side, referred to in my last year's report, is still giving

satisfaction. The "crush" which occurred some time ago on the north side of this mine is quiet. The pit and ventilation in general are kept in the usual good condition.

A comfortable passenger car has been put on the track, for the purpose of conveying the men from the village to the mine and back. This car runs several trips morning and evening and is capable of holding 200 men. There is also a wash and dressing house for the miners, heated and supplied with hot and cold water, with a bath-room therein.

#### SYDNEY COAL COMPANY.

Work has been going on, on a small scale, at this Colliery during the year past. There are 15 rooms broken off, at right angles from the level and driven towards the rise or crop of the seam, in which 15 pairs of miners work. The inside room is turned off about 80 feet from the face of the level and driven about 80 feet up and the other rooms in advance of that in regular order—the outside or 15th one being up 420 feet from the level. The level has been extended and is at this date in a distance of 1,950 feet from the mine mouth. A pair of headways 600 feet in length extends from this level to the air-shaft, which is sunk through the crop of the seam. Through this air-shaft the workmen go to and from their work, and also one of the headways serves as a travelling road.

A line of stopping has been put in this season in order to assist the air to go around the face. The ventilation is fairly good notwithstanding neither fan nor furnace is in use at this Colliery.

#### NEW CAMPBELLTON.

This mine has been working steadily during the season. A lift of about 500 feet has been gained direct to the bottom of the slope. In this lift rooms are broken off,—right and left or on both sides of the slope and are 40 feet in width and roads on both sides of the room laid in. The pillars are about 25 feet wide. It is found in this width of room that larger coal can be obtained by holing the whole way across the room, and then shearing one side. The pressure of the roof, assists in bringing the coal down with very little powder being used. The holing is done chiefly in the clay that underlies the coal. It is found to be quite soft in some places. The miners can dig it out quicker than they can the coal thus making but little slack. Timbering is good and the ventilation fine. The underground manager, Mr. Ferguson is a very careful man—not one accident having occurred since he took charge.

#### BROAD COVE MINE.

The slopes are down a distance of 985 feet gaining two lifts on each side of the slopes, and levels have been driven on both sides of these lifts a distance of 200 feet each. At the top of the upper lift a pair

of levels are driven at each side of these slopes going east and west, and will be continued as return airways. At lift No. 1 on both sides east and west, balances have been driven 240 feet each and from No. 2 lift balances have been driven 350 feet each and rooms broken off from all these balances and are ready for work.

A large lodgement is made in the mine capable of holding 250,000 gallons of water—the mine making at present about 50 gallons per minute. The output at present is about 100 tons per two shifts. It could be easily increased to 300 tons per shift if required.

Two large pumps are in place in the mine—one a Knowels and the other a Northey, also two small ones for sinking. A 100 h. p. hoisting engine is erected at No. 2 slope and a large one ordered for No. 1 slope. One set of Babcock and Wilcox boilers, two vertical tubular and one horizontal have been set up. A reservoir to supply above boilers with water is completed.

A screening and picking belt plant, complete capacity about 750 tons per day, is now ready for use. Bankhead and bank-house and trestle about completed, height of bank 26 feet 6 in. size of bank-house 105x65 feet. This bank is a substantial structure framed and built of large timber.

A fan is in operation called the Schiele fan capable of giving about 35,000 cubic feet of air per minute. An engine-house is built and a boiler-house almost finished. A blacksmith's and carpenter shop are completed, also ten blocks of miners houses are being built.

#### PORT HOOD COAL CO., LTD.

The slopes have been extended 300 feet since my last report making the whole distance down, at this date, 1150 feet. At this point levels were turned off north and south. The south levels have been driven in 1500 feet, and from them two balances have been driven and 11 rooms broken off each. Between the top of these balances and the old rise workings there is a barrier left of 50 feet in width. It was found in this mine that the action of the air on the roof made it very tender and consequently the Management decided to drive the rooms not more than 12 feet in width and booms put in across two feet apart with a centre prop under each. This has been done making the places more safe. The north levels are in 1200 feet, with two balances driven up and 11 rooms broken off each; one balance complete with one cage and drum working, and two others being put in, one on the north and the other on the south side.

On the surface a new bank-head frame has been erected with one bar screen and two knocker screens making four different grades of coal reducing the latter to duff. The picking belt has a movable jib which is raised and lowered into the cars by the same engine that operates the belt tiple and screens. This is something new and saves the breakage of coal.



There has also been erected one pair of winding engines, 250 h. p. each, cylinder 20" x 42" stroke with a pair of 7 foot drums directly connected. One of the drums is loose on the shaft so that the rope can be lengthened or shortened by the engine-man. Also there is a double 10" x 12" cylinder engine with two friction drums erected for hauling the coal out to the wharf by the tail rope system. This coal is delivered into the pockets on the pier. The coal is carried in two and three ton cars from the screens to the wharf. The pit tubs are one ton capacity. In the same building there is a 16" x 26" Rand compressor which compresses air for two Cameron pumps and two mining machines. There are also two Babcock & Wilcox boilers in a separate building, 500 h. p., guaranteed 750 h. p. There is in operation a 7 feet Buffalo fan which supplies the mine at present with air. This fan is capable of giving 40,000 cubic feet of air per minute and has done good work so far. It has been decided however that a larger one would shortly be required owing to the extensiveness of the mine and the dip of the seam and the Management has ordered a 14 feet one.

There has been built a new engine house, a compressor, and boiler house. The pier has been extended 135 feet by driving piles. It was found that the block and crib work was not satisfactory as the sand followed and banked up as the wharf extended. Where the piles have been driven there has been no sand collected and 23 feet of water has been obtained, the intention is this winter to pile it out 225 feet more where they expect to have 34 feet of water.

In addition I beg leave to say that when you were in Cape Breton county about two years ago, you remarked that in your opinion that as the mining in the coal mines were extended towards the deep of seams that the pillars should be left larger owing to the additional pressure and thickness of strata. In the above case I notice by the pillars where they are small, that the weight crushes the coal and in the extracting of them it is difficult to get all of the coal, in fact in some sections of the mines not one half of the coal can be obtained from small pillars. I would suggest that as the workings of the coal mines in Cape Breton extends to the deep, that from time to time the pillars be left larger so as to suit the pressure brought on. In this way nearly all the coal could be saved which would be in the interest of the companies and Government.

Also I would wish to remark in the case of abandoning a coal mine, that such company owning such mine should be compelled to draw all the available pillars before such pit be abandoned for any length of time. That is where the roof and bottom is of such a nature as to be effected by contact with water. This is in order that the coal left in pillars should not be destroyed. This does not include mines where the roof and bottom are hard and are not affected by long standing water.

I am yours obediently,

P. NEVILLE,

*Deputy Inspector of Mines.*

*Accidents.*

DATE.	MINE.	NAME.	AGE.	OCCUPATION.	REMARKS.
April 18.	Caledonia . . . . .	Alexander Howie. . .	19	Laborer . . . . .	Killed by runaway coal wagon in east deep.
" "	" . . . . .	John McDonald . . .	55	Miner . . . . .	Leg broken " "
" 23.	Broad Cove. . . . .	Kenneth Stuart . . .	25	" . . . . .	Killed by runaway empty wagon in bottom of slope.
" 26.	Dominion No. 3.	Andrew Anderson . .	15	Driver . . . . .	Killed by fall of roof stone in room.
May 6.	Caledonia . . . . .	Michael McDonald . .	24	Laborer . . . . .	Leg broken; caught between full wagon at pit bottom.
" 15.	Dominion No. 1.	John Carmichael . . .	16	Driver . . . . .	Collar bone broken; ran against a coal box.
June 1.	" . . . . .	Samuel Gulen. . . . .	26	Laborer . . . . .	Collar bone broken; caught between empty coal boxes at deep landing.
" 19.	" . . . . .	John B. McDonald . .	33	Miner. . . . .	Killed by piece of roof stone falling on him while undercutting in room with machine.
July 11.	Caledonia . . . . .	Michael McNeil . . .	25	" . . . . .	Slightly hurt about the body by fall of coal from face.
" 12.	Reserve . . . . .	John Leary. . . . .	34	Laborer . . . . .	Collar bone broken; between coal box and pillar.
Aug. 19.	Caledonia . . . . .	Daniel McDonald . . .	60	Miner. . . . .	Fatally injured by shot going off while firing squib.
" 22.	" . . . . .	Arthur Carnew . . .	22	Loader . . . . .	Arm broken by a piece of stone falling on him from roof.
" 23.	Dominion No. 2.	John Purdy . . . . .	22	Shiftman. . . . .	Elbow broken by a piece of chain falling down shaft upon him.
" 31.	Reserve . . . . .	Henry March . . . . .	30	Loader . . . . .	Fracture of leg by piece of coal at face of room.
Sept. 16.	Caledonia . . . . .	Alonzo Gibbons . . .	16	" . . . . .	Leg broken by coal cutting machine falling on him from working table.

MINE.	1900.			1901.								
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
Caledonia.....	1-22	12	22	24	11	8	13-19	20	5-17	15	4-21	14
International.....	5	6	7	8	26	15	15	18	10	22	15	30
Dominion No. 2.....	13	21	18	4-14	18	16	20	14	14	1	19	13
Reserve.....	15	3	24	10	19	14	12	16	18	25	20	16
Dominion No. 1.....	23	17	21	23	13	13	10	8	5	27	13	24
Dominion No. 3.....	25	13	13	14	12	7	29	15	12-20	8	29	13
Dominion No. 4.....	25	13	13	7	12	6	29	15	12	.....	.....	.....
Sydney Coal Co.....	26	22	14-17	11	22	11	18	11	12	2	5	6
Nova Scotia Steel Co.....	27	24	15	12	23	23	18	10	8	6	6	7
Campbellton.....	29	27	.....	"	.....	18	17	15	22	.....	31	23
Gowrie and Block House ..	30	28	19	22	27	29	.....	27	28	26	30	11
Broad Cove.....	.....	.....	.....	16	.....	20	25	24	.....	19	.....	20
Port Hood.....	.....	.....	.....	17	.....	21	26	22	.....	18	.....	18
Antigonish.....	.....	.....	.....	.....	.....	.....	.....	.....	25	.....	.....	.....
St. Peters & River Bourgeois	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	.....

*Cubic Feet of Air Per Minute Circulating Through Mines year ending September 30, 1901.*

MINE.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
Caledonia .....	78200	80075	68200	68700	69890	92864	87900	789000	89900	98900	86900	86210
International .....	57900	74602	70600	75000	86200	76100	78550	76900	68960	87200	87500	87900
Dominion No. 2 .....	8750	12900	12000	10000	10500	10000	9800	9700	10200	9600	8300	9000
Reserve .....	176200	129980	170000	176000	175802	174600	169900	172600	174900	173100	170000	169800
Dominion No. 1 .....	102270	101467	98900	97000	98700	92320	90100	99350	102000	90000	91700	80100
Dominion No. 3 .....	39200	38900	35500	35800	37460	37240	42200	41200	41602	42800	42100	42800
Dominion No. 4 .....	1200	9900	16960	16200	13907	18000	13800	9800	9879	9700	.....	.....
Sydney Coal Co .....	6800	8000	6400	6900	6070	6000	6085	6000	5900	6890	7500	6800
Nova Scotia Steel & Coal Co .....	98200	95870	101090	95775	98970	99700	98000	99233	87515	88900	89790	89220
New Campbellton .....	20750	25700	.....	.....	.....	21900	20500	22500	30800	.....	31300	32301
Gowrie and Block House ..	14000	18000	15500	18900	13260	9220	13500	15390	.....	12998	15600	15700
Broad Cove .....	.....	.....	.....	10000	.....	21900	20500	15500	.....	14200	.....	14900
Port Hood .....	.....	.....	.....	12000	.....	21960	13500	34300	.....	33100	.....	34200

*Accidents.*

DATE.	MINE.	NAME.	AGE.	OCCUPATION.	REMARKS.
1900.					
Oct. 8.	International ..	Alfred Leonard.....	15	Doorkeeper .....	Killed getting in cage at pit bottom.
Nov. 15.	Caledonia ....	William Campbell ..	"	" .....	Arm broken, spragging coal wagon.
Dec. 12.	Dominion No. 4.	John Kennedy ....	25	Laborer .....	Three fingers broken; caught between sections of fly wheel in course of construction.
Dec. 21.	Dominion No. 2.	Arthur White.....	30	Sinker .....	Sprained ankle; fell down shaft forty-two feet.
Jan. 2.	"	John Davidson.....	34	" .....	Injured by explosion of dynamite at pit head.
"	"	Howard Harty ....	22	" .....	Injured by explosion of dynamite at pit head.
"	"	Daniel Gillis .....	29	Engine Driver .....	Injured by explosion of dynamite at pit head.
Jan. 5.	Dominion No. 1.	Daniel Barrett .....	25	Loader.....	Foot smashed by a piece of coal falling on him in room.
Jan. 21.	Caledonia .....	James Scott.....	60	Miner.....	Leg broken; fall of roof coal drawing pillars.
Feb. 7.	Dominion No. 1.	George Thistle .....	27	Laborer .....	Killed by runaway wagon from pit bottom.
March 4.	"	Murdock McDougald	27	" .....	Fatally injured on surface between two cars.

*Accidents.—(Continued.)*

DATE.	MINE.	NAME.	AGE.	OCCUPATION.	REMARKS.
March 15.	International ..	Donald McIntyre ..	60	"	Fatally injured; caught by runaway coal box from bank on surface.
" 25.	N. S. Steel Co..	Daniel Hyde .....	33	Miner	Seriously injured; fell under full trip coming from the deep while trying to steal a ride.
" 26.	Caledonia ....	Duncan McMillan ..	24	"	Leg broken by piece of stone from roof while drawing pillars.
" 26.	Dominion No. 1.	Edward Gale .....	24	Laborer	Lost two fingers by piece of coal falling on him from face.
" 27.	" "	Daniel McCormack..	56	Miner	Seriously injured by shot going off while setting fire to squib.
April 2.	Dominion No. 3.	William Hunt.....	25	Loader	Arm broken by piece of coal from room face.
April 4.	Dominion No. 1	George Keely .....	28	Landing Tender...	Hurt about body; caught between coal box and pit prop.
April 11.	" "	Murdoek McDonald.	18	Loader .....	Hurt; caught between full box and roof.



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## COAL MISCELLANEOUS.

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There has been some progress made in the development of the coal resources of Inverness county.

At Port Hood, the Port Hood Coal Mining Company have their plant well under way, and have shipped steadily to the neighboring markets. At Mabou it is reported a sale has been made to capitalists who are prepared to sink to win the submarine area at this point, said by Mr. Brown, in his Coal Fields of Cape Breton, to contain a very large amount of coal. At Broad Cove the Inverness and Richmond Collieries and Railway Company has continued the sinking of the slopes. The seam continues regular in dimensions and dip, and the quality is said to continue very satisfactory. The railway from Broad Cove to Hastings has been continued to a junction with the Intercolonial Railway at Point Tupper, thus securing to the county of Inverness uninterrupted connection with the railway system of the continent. At Chimney Corner no work has yet been commenced, but it is stated that an English syndicate is expected shortly to take over a large block of areas and to begin development work.

During the summer one of the department Calyx drills was started at Hantsport by the Hantsport Development Co. with a view of testing the possible presence of coal seams in that district. Up to the end of the year no discovery of value had been reported.

In the Musquodoboit Valley the Messrs. Reid and Archibald used one of the departmental hand drills for several months. The work done up to the close of the season proved the presence of small seams of coal. It is expected that this work will be continued during next season.

In the Kennetcook district the other Calyx drill put down several holes at Upper Kennetcook. Considerable difficulty was experienced in boring through the soft shales. The presence of seams of coal from 12 to 30 inches in thickness was reported.

The Diamond drill, after the work at North Sydney was finished, was loaned to the Intercolonial Coal Company. They have taken it underground to their 1500 feet level, and are boring from that point with a view of testing the underlying seam in depth.

The direct operations of the drill have been in charge of Messrs. J. L. Phinney and J. Power, under the supervision of the department. In the control and management of the five drills in the hands of the department I have been assisted by Mr. D. Weatherbe.

## GOLD.

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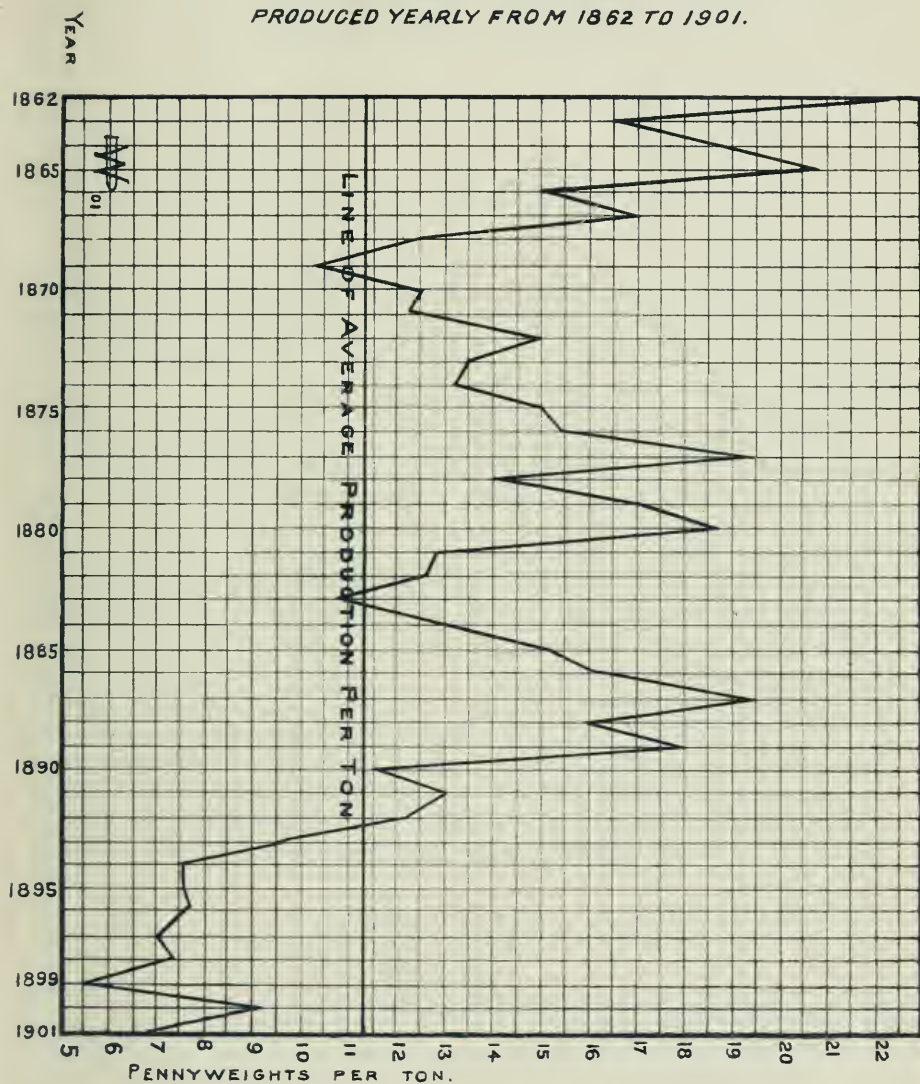
The returns for the year ended September 30th show that 30,537 ounces were extracted, about the same as during the year 1900. The output was to some extent hindered by the unusual dryness of the summer months. I have, in previous reports, referred to the unsatisfactory way in which returns have been made from the mills. It is now decided that in future the penalties provided by the Act will be enforced against those failing to comply with the requirements.

I append a detached report from Mr. Weatherbe of the operations in the mining districts, and further details will be found in the tables at the end of the report.

The accompanying graphic chart shows the increased attention given to the mining and milling of comparatively lower grade ores, viz:



TABLE SHOWING N<sup>o</sup> OF DWTS. PERTON  
PRODUCED YEARLY FROM 1862 TO 1901.





## REPORT ON THE GOLD MINES OF THE PROVINCE.

FROM SEPTEMBER, 1900, TO SEPTEMBER, 1901.

TO DR. E. GILPIN, JR.,

*Deputy Commissioner and Chief Inspector :—*

SIR,—I beg to submit for your approval the following report on the Gold Mines for the past season, in which I have endeavored to describe the methods employed, and the progress and improvements noted since the last official visit.

Prominent among these is the new Cyanide plant at Caribou, the object of which was to treat the old tailing beds of the districts. The success or otherwise of this scheme will no doubt be observed with interest by the miners of the Province.

A distinct hardship was occasioned throughout most of the various districts by the exceptionally dry summer, and this was felt more particularly by the mill men, who in several instances had to shut down for several weeks at a time. Rapid strides have been made during the past few years in the mill practice through the Province, and the methods and appliances now used, particularly in some of the larger plants, will compare equally with those employed elsewhere throughout the mining world. The benefits derived from the labors of Mr. Faribault, of the Canadian Geological Survey, become more marked each year, and the maps of this department may be found in the hands of the miners in nearly every district.

## HALIFAX COUNTY.

## WAVERLEY.

*The Waverley Gold Mining Co.* J. G. McNulty, Manager ; J. C. Puttner, Underground Foreman ; and 160 men on the pay list.

During the past year work has progressed in this mine at a rapid rate, and strict attention has been paid to the extending of the ore reserves which now form a comparatively large body.

The main shaft dipping north-westerly at 52° has now reached a

depth of nearly 500 feet, and sinking is still in progress. The various levels have been extended to the following distances from this shaft :—

No. 1 North-East 500 feet, and South-East 545 feet.

No. 2        “        380    “        “        640    “

No. 3        “        130    “        “        320    “

No. 4                    “        “        “        240    “

At a depth of 470 feet level No. 5 has been commenced to the South-East.

A shaft termed “North No. 2” intersects No. 1 level at a point 350 feet from the main shaft, and has been sunk to a depth of 80 feet below the level. At a height of 100 feet above the level in this shaft an intermediate level has been driven easterly 80 feet and south-westerly sixty feet, and small blocks taken out above the first portion, and below the second. This shaft dips at an angle of 65° to the north. About 530 feet farther east on this north leg of the vein, a pit called the “Cameron Shaft” is being sunk, though it has as yet only reached a depth of 18 feet, and 600 feet from the main shaft on the south leg: another shaft called “South No. 2” is down 125 feet, with a dip to the south-east of 45°. This is to be sunk until connection has been made with the extensions of the levels in the main workings, thus providing an additional air and travelling way, as well as testing the values and continuity of the ore.

In my last report on this mine, I mentioned a dislocation as occurring at 220 feet north east of main shaft in No. 2 level. This proved on exploitation to be merely a pinch in the vein; but though the seam could be followed, it is only at the present heading 160 feet from the break that the ore appears to be increasing again in size, and it now measures about 3 inches in thickness.

The working belt in this mine is composed of slate between “whin” walls and measures from 7 feet to 8 feet across. In August last an attempt was made to economise in the cost per ton of mining by only extracting about half of this belt, the remainder, a hulk of 3 feet to 4 feet being left on the hanging wall.

This rock, though in itself of a fairly compact nature, is apparently not supported firmly, a distinct “parting” often occurring between it and the “whin” wall. Several heavy falls have already taken place, and though the stopes are kept filled with black rock as close to the working places as is practicable, little timber is used, and altogether it does not appear to be safe for those working underneath, especially

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as in the stopes where this is the practice the rock is lying at a fairly flat angle.

Indeed it is a question whether, (if possible at all,) the placing of extra timber necessary to make this secure, would not be more expensive than the previous practice of taking down the whole belt, and leaving the valueless rock on the scaffolds.

However, I was informed that the system is to be discarded and the latter method adopted as formerly.

The above method might be successfully applied on the south leg of the fold, in level No. 2, where the vein suddenly jumps from the foot to the hanging wall, and the rock left in the belt would be supported, to a great extent at least, by the solid footwall underneath even where the rock dips at a steep angle.

During the past year upwards of 1700 feet of driving and sinking have been accomplished as well as a considerable amount of stoping; enough ore, in fact, having been extracted to supply 20 to 30 of the 60 stamps in the mill.

Two of the four Wilfley tables have also been kept going. No additions or changes of any importance have taken place with regard to the plant which has been fully described in previous reports.

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*W. Temple*—W. Temple, operating on some areas adjoining the above company, has sunk and cribbed a vertical shaft to a depth of 165 feet.

At 145 feet the main belt was intersected, and has now been passed through, and when a little greater depth has been reached, a cross cut will be made south, about 20 feet to the vein, when driving and stoping are to be commenced. A small boiler and engine supply power for the hoist and a sergeant steam drill is used in sinking.

*S. Smith*—A 100 ton Cyanide plant was erected during the year by a Mr. Sydney Smith from the United States. After treating about 2000 tons of tailings, the plant was shut down, not enough gold being extracted to make it pay.

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#### COW BAY.

*Evangeline Gold Mining Co.* L. Holland, General Manager; Frank Tinney, Foreman, and 15 men.

This Company has recently been reorganized, and the property now stands in the name of J. A. Link, et al.



The new management have been at work in the mine for about seven weeks, and the workings at present appear in the following shape: The vein averages probably about 12 inches of quartz in a  $4\frac{1}{2}$  working belt of whin, and its strike is approximately north and south, with a vertically inclined dip. The strike of the measures here is about east and west with a uniform dip to the south of  $30^\circ$ .

Two shafts 90 feet apart are sunk on the vein, the north one to a depth of 150 feet, and the south shaft to 145 feet.

At 78 feet from surface in the north shaft a tunnel has been driven north 47 feet to a 10 foot belt of hard slate, where the vein apparently turns to the west, and decreases in size.

This slate band being conformable with the strata, cuts both shafts in its dip to the south.

All the ore has been worked out between the two shafts and to a distance of a few feet south of the south shaft in which at a depth of 45 feet from surface, a tunnel was driven south for 50 feet, where it encountered the main slate belt of the district. This body extends from here to the salt water, probably a mile to the south.

Immediately underlying this slate belt, and on the dip of the rock, is supposed to lie the main pay streak of the mine, which is said to be about 35 feet in height.

At the bottom level a tunnel on the vein now in course of progress, has reached a point 30 feet south of the south shaft, and is to be extended to prove this zone of rich ore. Hand tools are in use at present; but if the mine proves workable these will be superseded by machines, which as the rock is being broken across the strata, will be of great advantage. The working belt which as mentioned above, is  $4\frac{1}{2}$  feet in width, might profitably be reduced, as no "true wall" is apparent on either side.

A Cameron pump lifts the water from the bottom to a Northey pump in the north shaft, which in turn discharges at surface.

The boiler supplying these, also supplies the hoisting engine.

The 5 stamp water power mill on the Cow Bay River to the eastward has not been used under the present management.

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#### LAKE CATCHA.

*The Lake Catcha Consolidated Gold Mining Co.*—Mark Anthony is manager of the property, and 35 men are at work below and on

the surface. The labors of this company up to the present time appear to have been chiefly devoted to prospecting and testing operations from which a good outlook is presented.

The chief work has been conducted on the "Anthony" lead, (named after the manager) situated 50 feet north of the supposed position of the anticlinal. The vein consists of about 2 inches of quartz in a 38 inch slate belt, part of the accompanying slate being also milled. Three shafts have been sunk on the dip (about 80° to the north) as follows: No 1, the most westerly is 60 feet deep; No. 2 is 40 feet east of No 1, and is 160 feet deep; and No. 3, east of No. 2 by 60 feet, is over 100 feet in depth.

Most of the vein between shafts 2 and 3 and to a distance of 120 feet west of No. 1 and 100 feet east of No. 3 has been worked out by underhand stoping.

Connection has also been made by stoping from the bottom of No. 2 up to the workings west of shaft No 1. The greater portion of the ore is still in position between shafts Nos. 1 and 2.

The measures appear to make the "west turn" of the anticlinal about 300 feet west of shaft No. 2, and at this point a shaft is being sunk through the surface to locate a belt of quartz 6 feet in thickness which has been cut further north, and which from the drift would appear to be of good quality. The surface earth and gravel in this locality ranges from 12 to 25 feet in thickness, which adds to the difficulty of prospecting.

About 50 feet north of the Anthony lead, and 75 feet east of the mill, an old shaft on the "Sheba" lead is being pumped out preparatory to making tests of the ore which is said to measure some 5 inches in thickness.

The mill is an old one, and has been moved to its present position during the past year. It contains 10 stamps, a 40 horse power boiler, and a 30 horse power engine, which latter runs the stamps, hoist and pump.

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*John H. Anderson.*—Only a small amount of work is at present being done on this property. W. Dukeshire, as foreman, and six men are employed, and are sinking a shaft, (already 60 feet deep) on the "Sheba" lead just south of the mill. The strata at this point has been moved by a heavy slip some 100 feet to the south. The fault probably lies between this shaft and the property of the above company.

The vein in this shaft only measures 1 inch in thickness, and when a depth of 70 feet is reached a cross cut will be driven south to intersect a 4 inch lead that was worked some years ago. Across the road to the north of the mill an old shaft is being opened up to test another lead.

The mill contains 10 stamps, a boiler and 30 horse power Leonard engine, which latter runs hoisting gear.

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*The Oxford Gold Mining Co.* G. E. Francklyn is in charge, and has a few men engaged in prospecting.

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#### CLAM HARBOR.

Little practical attention has ever been paid to this district by the mining or investing public; but the quiet and diligent prospecting efforts of P. Dunbrack and others during the past few years have now been rewarded, and a remarkable *exposé* of the district's structure is exhibited, and will prove well worth while examining by the student of the formation of the Nova Scotia Gold Measures.

As may be seen by reference to the Geological Survey Map of this locality, the district is situated on a local fold of the north leg of the main Tangier and Harrigan Cove Anticlinal.

At the extreme end of operations, at area 580 and vicinity, a corrugated vein measuring about six inches in thickness, has been traced by a complete surface opening, from the north dip round the eastern bend of the fold to the south dip—a distance of some 200 feet in all, and a person standing on the apex can with the eye follow this lead directly round the turn.

The axis has a decided pitch to the eastward, and the dip of the rock is naturally flattish on top.

At area 577 a vein, probably inside the above, producing about 5 inches of quartz, has been opened to a depth of 15 feet on the north dip, and for a distance of several hundred feet westerly by pits until it appears to turn to the south.

Some distance west of the road, probably at area 471, a vein has been opened directly on the western end of the dome, and at short distances to the east or inside of it, two other veins have been cut, and another was opened about 50 feet to the west, also on the "turn."

A peculiarity regarding these 4 veins lies in the fact that though lying on the western end of the dome, they all dip to the east, and

have thus probably been "overturned." Several other leads to the south have been traced for considerable distances, and trend northward as they are followed east.

One of these, the "Dunbrack" lead, has been opened for about 700 feet, and in common with most of the veins in the district the quartz has a corrugated or barrel formation, shows free gold and is well mineralized.

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#### TANGIER.

*The Worcester-Tangier Gold Mining Co.*—Arch. McPhail is manager, and thirty men are employed. A shaft is down on the "Little South" lead to 160 feet. At this point cross cuts have been driven north 50 feet to a vein, and south 70 feet to a shaft on the Nugget lead, which from here has been drifted on east 140 feet and west 130 feet. Above the east level the ore has been worked out in a rectangular block to within 40 or 50 feet of the surface, and to a distance of 100 feet east of the stope.

West of the shaft the ore has been worked back by overhand stoping from the end of drift to a point 40 feet from surface in the shaft.

From the shaft bottom another cross cut has been driven south 35 feet to the workings on the "Murphy Twin" belt. These workings are now 215 feet in depth, and connection has been made with the end of this cross cut by a level driven 90 feet east of the east shaft. The west shaft, 100 feet from the first, is at an equal depth, and the ground has all been worked out between the shafts and to a distance of 40 feet east of the east one. Two small parallel cross sectional faults occur in the workings and dip to the east at about 75°. One intersects the east shaft near the surface, and the other lies about 100 feet to the west. The dislocation caused by these only amounts to some few feet in each case, and the movement of the hanging wall is from north to south when observed from the east.

Some 14500 superficial feet of work, including driving, sinking, and stoping has been done on the veins in above workings since the last inspection.

The power for the hoist and two cornish pumps, which though in different shafts are connected by driving rods, is supplied by a 50 horse power boiler and 30 horse power engine.

The mill, which consists of 20 stamps, is operated by water power, but also contains an auxiliary steam plant, including a 60 horse power boiler and 40 horse power engine.



Water not being available during the past few months, this plant was utilised until within a few weeks of present date when the mill shut down. Only 10 stamps have been operated as the plates, for the remaining 10 were removed from the mill some time ago.

The mill building also contains ore bins of 50 tons capacity, rock breaker, automatic feed, and one Wilfley concentrator, which latter has not been used for over a year.

I was informed that water power could be employed all the year, if the dam was raised to a height of 6 feet. The head at present, (about 20 feet) is sufficient, if a larger reservoir were available.

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MOOSELAND.

*The Arlington Gold Mining & Milling Co., Ltd.* This company, though idle at present, has during the year completed their mill, which contains 5 stamps, an ore bin, automatic feed, and foundations for five more stamps. A large, new boiler and engine are also installed in this building, and will operate battery, hoist and pump.

The shaft on the "Cummings" lead, some 5 inches to 8 inches in thickness, has been sunk to 100 feet, and is in good order. J. Reynolds is acting as Manager and Agent on the ground.

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MOOSE RIVER.

*The Touquoy Gold Mining Co.* This Company and the Colonial Mining Company, whose workings are now connected, are being operated by the same staff, consisting of R. Kaulback, Manager; Ed. Jennings, Foreman, and 14 men.

The Touquoy shaft has been sunk on a dip of 60° to 60 feet, at which depth it intersects a large slate fissure belt containing two quartz veins, and measuring about 12 feet or more in thickness. This ore takes the form of a shoot 40 feet in height and pitching to the westward at a medium angle. From this point the shaft turns south and west following the fissure to a total depth from surface of 160 feet. At 45 feet in this shaft a tunnel was driven north across the strata for 100 feet, and intersected several small veins, none of which however, appeared to carry values sufficiently high to warrant working.

At the foot of this shaft another cross-cut is being driven to cut the "New" lead 5 inches in thickness, and lying 27 feet from the "Britannia," on which this shaft was first sunk. This cut is now in



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about 15 feet, and when the desired point is reached an upraise will be made to connect with the workings on the adjoining Colonial Company's property.

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*Colonial Mining Co.* At a distance of 46 feet east of the Touquoy shaft on the above mentioned fissure belt, (which has been worked out to the surface) this Company's shaft has been sunk to a depth of 35 feet, at which place a cross-cut has been driven south 40 feet, and is to be extended to cut the "Britannia" lead.

At 27 feet from the shaft in this tunnel the "New" lead was tapped, and is now being drifted on, the operations at present consisting of a drift 15 feet east and a drift and small stope 30 feet to the west.

In this latter place a machine drill is at work driving, and the point will soon be reached at which the upraise from the Touquoy workings mentioned above, will connect. In the cross-cut from the shaft to these workings several small unproved veins were cut. Some specimens I was shown from this "New" lead, or No. 3, as it is also called, showed exceptionally fine coarse gold.

It is the intention, I believe, if everything proves as favorable as at present appears, to sink a vertical shaft to the westward so that all the leads may be operated from it.

A single track tramway has recently been completed from the deck-head of the Touquoy shaft to the mill. This will probably be changed to a double track gravity road with large 1 ton ore cars.

The mill is of 15 stamps with two Frue Vanners, and is operated by the water power supplied by Moose River. It has been idle since July owing to low water.

The plant also includes a 40 horse power boiler and small hoisting engine, a 4 drill air compressor, and a No. 7 Cameron Vertical Sinking Pump with a capacity of 100 gallons.

Mining and milling is said to cost here about \$2.00 per ton.

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*The Baltimore and Nova Scotia Mining Co.*—L. W. Getchell, manager, W. J. Prisk, superintendent, and 50 men employed.

This new company, understood to be well capitalized, having recently purchased the property from the Guffy-Jennings Co., are actively prosecuting the work so well begun by the latter company.

The main vertical shaft, 14 feet by 4½ feet, inside timbers, has now reached a depth of over 560 feet, and is to be further sunk until a

depth of 1000 feet is reached, when it is estimated that a cross cut north of 125 will be necessary to tap the belt, as the shaft-collar is situated at this distance from the out crop, and the vein was intersected at 500 feet. This shaft is only partly fitted with a ladder-way, and the men travel in the tub and on the incline.

At 400 feet No. 1 level has been driven west 200 feet and east 300 feet, and at a distance of 130 feet east of shaft the incline by which the mine was originally worked meets this level. This incline was supposed to follow the pitch of the best ore, and was driven on the belt from a shaft 130 feet deep and at a distance of about 600 feet east of the main vertical shaft.

No. 2 or the 500 foot level is in west 600 feet and east 500 feet.

At about 400 feet west of shaft in No. 2 level the belt pinches out, and at the heading cross cuts have been driven north 20 feet and south 40 feet to pick up the vein; but up to date this work has been unsuccessful.

Cross cuts have also been driven north for prospecting purposes at the shaft, and at the east head of this level. In each case these are in 100 feet.

Most of the ground between Nos. 1 and 2 level is stoped out west of the shaft, and a block 130 feet long has been worked away under No 2 level to the west. A roof of 18 feet was left here between stope and level, and it was in the east end of this working place that a few weeks ago Thomas Monk was killed by a fall of part of the pillar.

About 700 feet to the south of the main belt on the surface a wide slate belt containing a large percentage of quartz has been opened by trial pits and proved for several hundred feet east and west. The company have 4 Rand and 1 Sullivan air drill, and those used are supplied by a 4 drill Ingersoll Compressor, set up in the engine house near the shaft. This machine will be enlarged to accommodate 10 drills when mining begins in earnest.

A new 40 stamp mill is in course of erection over the shaft, and is to have 20 stamps on each side, back to back.

The old 10 stamp mill is still on the property, though not in use at the time of my visit, and will probably be dismantled when the new plant is ready.

If the present Cyanide plant in the district proves a success, a duplicate plant will be installed here, and the tailings cyanided direct from the plates without previous concentration.

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*Cyanide Plant.* This plant, which has a capacity of 100 tons, was erected by J. R. Stuyvesant, the owner, during the spring of the present year, and having been recently completed, has only been running for a short time.

H. S. Badger is Manager, and O. Collings has charge of the laboratory. Twelve men are employed in and about the plant, which consists of the following apparatus:

*Parts.* Two solution tanks, one for weak (.10%), and one for strong, (.25%) solutions.

Leaching Vats 25 feet in diameter by 4 feet high. These,—4 in number,—are made of wood with a false, perforated bottom, covered by a filter bed of 8 oz. duck and cocoa matting, and an innovation in their construction is the introduction of finely perforated pipes on the bottom supplied by an air blast which renders leaching more rapid with slimy ores.

Two settling tanks, each with double compartments connected by an opening below.

The precipitating boxes placed in long rows and containing zinc filings.

A large receiving tank.

*Method of Procedure.* The auriferous sand or "stock" is taken from the old tailing beds by horse scoops and dropped into cars which are raised by rope haulage to the top of a high trestle and dropped into hoppers and shoots which supply the 4 vats. While these are being filled the sand is kept stirred by a man to keep it from packing. As the ores from which these tailings were produced are rendered more or less acid by the decomposed pyrites, lime is introduced as an alterative alkali. When full of stock the strong solution is added until it stands 3" above the sands, and this level is maintained throughout the process, the stopcock being closed to allow contact with the solution, which often stands over 12 hours before being drawn off. This is replaced by the weak solution, and finally water is added to drain off the remaining cyanide contained in the sands. Iron pipes communicate with the spaces below the false bottoms and convey the now auriferous liquid to the settling tanks, where the scum is removed. The solution, though attacking brass or bronze does not affect wood or iron. From here it flows into the zinc boxes and the gold is precipitated. The precipitation is effected by shavings of zinc placed in wooden troughs—the "zinc boxes." They are divided into compartments by partitions which cause the solution to flow alternately upward and downwards. Each alternate compartment is empty in order that in passing through the shavings, the solution may invariably flow upward. By down-

ward flow the gold slimes would collect on the upper surface of the zinc, and thus impede further flow, but by upward flow these are precipitated on the under side of the zinc, from which they continually drop off, and permit free passage of the solution.

The exhausted solution flows from here to a sump tank from which it is pumped to the original storage tanks, and brought up to strength.

From the operations of this plant from July to September, inclusive, 4,145 tons yielded \$5754.00.

I was informed that the cost of treatment here was a little over 60 cents per ton, though this would probably largely depend on the position of the beds from which the tailings were taken. A reduction would be effected by taking fresh tailings direct from the plates.

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#### FIFTEEN MILE STREAM.

*The Egerton Syndicate.*—This company, successors to the New Egerton Mining Company, who stopped operations in 1899, commenced active work in March, 1901, and under the management of W. Borlace, are sinking a new vertical shaft. L. McLean is foreman, and 47 men are employed.

The shaft, 13 feet by 6 feet in cross section inside timbers, is divided into three compartments—hoisting, pumping, and ladderway, and cages are to be used in the former.

Squared timber, 8 inches by 9 inches, is used, and the setts are placed four feet apart with the ends of the cross pieces hitched in the rock. The shaft is situated a short distance north of two large belts, the "Harvey" and "Mother Seigel," each 12 feet in thickness, 16 feet apart and dipping at about 30° to the north.

The depth reached at the time of my visit was 147 feet, and the hanging wall of the "Harvey" belt had already been penetrated and showed gold. Two other small veins had also been cut overlying the "Harvey."

Two No. 3 Rand air drills are employed in sinking, the compressor supplying these being situated in the mill building. A steam pump is used for unwatering.

The timbering, ladderways and platforms are all of the best material and in good condition.

The present boiler and engine used in hoisting are of insufficient power, and have just been replaced by a new 60 horse power boiler, engine, drums and hoisting gear. The old Ledgerwood cableway is



to be abandoned and a tramway from shaft to mill is in course of construction.

Neither the Egerton steam mill of 30 stamps nor the Stanley 20 stamp water mill have been used for crushing since January, 1899. Besides the air compressor, the mill building contains two boilers, one of 100 horse power, and the other of 35 horse power, a mill engine and an electric light dynamo.

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#### HARRIGAN COVE.

*The St. Anthony Gold Mining Co.*—The St. Anthony Gold Mining Co., as at present organized, has been operating on the St. Anthony lead for the past year, and from March, 1901, to August, 1901, inclusive, 1281 tons yielded 1289 ozs. of gold, or nearly \$20.00 per ton. H. Sanders is in charge, with Angus McDonnell as foreman, and about 50 men on the pay roll.

The vein has kept an average thickness up to the present time of about 8 inches, though in both the east and west faces of the workings it now shows much smaller. It is expected that this decrease in size is only local, at least in the western end, as at several other points in the district, the vein has been proved to be widening.

The rock dips at 55° to the south and four inclined shafts have been driven on the lead.

No. 1, the most westerly of these is 113 feet deep, and the ore has been worked out for 35 feet west of the shaft, and to a height of 50 feet from bottom. At this west face a vertically inclined cross-sectional fault is encountered, and a tunnel has been driven west for 50 feet at a height of 40 feet from the bottom.

No. 2, or the "Pump" shaft, so called, is 120 feet east of No. 1, and 170 feet deep.

No. 3, or the "Main" shaft is 146 feet east of No. 2, and has reached a depth of 190 feet.

All the ore between shafts Nos. 1 and 2, and between No. 2, and to a depth of 110 feet in No. 3 has been worked out, as has also, with the exception of a bluff 40 feet long, and 25 feet high, the ground between the 110 feet level in No. 3 and No. 4 shaft, which is situated 124 feet to the east of No. 3.

No. 4 (the east shaft) is 60 feet deep, and a block 30 feet high and 40 feet long has been worked out east of it, and a tunnel driven 35 feet at a height of 10 feet from bottom level.

I found the ventilation, ladderways and methods employed at this



mine to be in accordance with the Mines Regulation Act, and though the timber in the old workings between the main and east shafts was in a very bad state, it is being replaced by new and sound stulls.

Hoisting is effected in No. 4 shaft by a "whim," and in the main shaft a self dumping skip is hoisted directly to the top of the mill building, which contains 10 stamps and a Wilfley concentrator, ore bins, rock breaker and automatic feed. A 90 H. P. boiler and 60 H. P. mill and hoisting engine are also installed here. This boiler supplies steam as well for two pumps in the mine.

Difficulty was experienced during the summer in securing a sufficient water supply, that which was used being obtained from a swamp, and used over twice. However, rights have been acquired over a lake about one-half a mile to the north east, and a supply pipe and pump will probably be put in here. The mill, office and other buildings about the property present a neat and business-like appearance. A new coal shed is in course of construction.

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*Kent Archibald's.*—This property, situated about 1200 feet to the west of the St. Anthony mine, is assumed to be on the same range of strata, and probably on the same lode. M. Archibald, with 18 men, are operating the mine, the vein in which measures about 12 inches in thickness.

A shaft has been sunk 100 feet, and the ore from small underhand stopes at bottom, 60 feet east and 50 feet west, has been extracted.

A five stamp mill has recently been built, and a small boiler and engine gives the necessary power required. The "water" question is also giving trouble here, pit water being used in boiler and mill.

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*Bluenose Gold Mining Co.*—At the time of my visit, the manager, Mr. A. G. McNaughton, was absent, and Mr. G. F. McNaughton was temporarily in charge. Stephen Monk is foreman, and about fifty men are employed in double shift.

The main or west shaft on the Springfield belt is about 500 feet deep, and is sunk on the vein, the dip of which is about 87° to the north.

From the end of and below the 100 foot level, 400 feet west of shaft, the belt has been worked out to a point 90 feet from shaft at the 460 foot level.

In these workings a cross cut at the 120 foot level and 126 west of shaft has been driven 39 feet to the "South Belt," and another at the 200 foot level, and 215 feet west of shaft is in south a few feet.

From the head of the 39 foot cross cut an upraise has been made to a level driven from a shaft on the "South Belt." This upraise is 50 feet high.

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The ground between the two shafts, 100 feet in length, has all been extracted below the 100 foot level, and a block has been taken out by the underhand system from the bottom of the east shaft, 425 feet in depth, to a distance of 275 feet east to the 100 foot level.

At a depth of 50 feet and 25 feet east of this shaft another cross tunnel has been driven 39 feet to the "South Belt," the workings on which, at present open, consist of a shaft 70 feet deep and a level driven west at this depth for 250 feet, at which point the upraise mentioned above taps it.

The underhand method continues to be the system of mining employed here, in which operations, including the driving and sinking four machine drills are used, (4 Rand and 1 Sullivan.) At the deck-head of the main shaft a 40 ton ore bin and a large size Gates rock-breaker are in position. From here the sized ore is carried by a skip up an incline to the mill ore-bins, which are of 125 tons capacity. The number of stamps has been increased from 20 to 30, and preparations are nearly complete for the installation of two Wilfley tables.

Two boilers of 80 H. P. and a 100 H. P. supply the engines of 40 and 30 H. P. respectively, which drive the mill, pumps, hoist and rock breaker.

The mill boiler uses water from a reservoir near the building which is supplied by a brook and swamp. This water is condensed and from the condenser is used over again by a novel scheme. It is fed through short, vertical iron pipes, with perforated horizontal branches each way at the bottom, and thus a rotary motion similar to the common spraying fountain is produced. Several of these devices attached to the exhaust pipe from the condenser are placed on top of a series of longitudinal gratings at intervals of a few inches, and alternately at right angles to each other, the whole measuring about 15 feet in height. The water flowing through these is thoroughly cooled and collected again in a tank, from which it is again used. Indeed I was informed that the same water had been used in this way for upwards of two years, little loss being sustained in the process. This mine is apparently being operated upon a most economic system, and probably with as proportionately low an expense sheet as is possible; great care being paid to details.

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*Royal Oak Mining Co.* This company, which according to its prospectus, is capitalized at \$1,000,000 controls the old Gladstone property. W. J. McIntosh is General Manager, and with Gardener McKenzie as Foreman, has 20 men employed.

The main shaft on the "Big Lead," so called, was continued last year until a total depth of 450 feet was reached, and at the time of my visit it had been unwatered, and the pumps were being put in order

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At the present time a steam pump lifting to within 200 feet of surface from which point a Cornish pump discharges to surface.

When pumped out, the steam pump will be replaced by another of the Cornish pattern.

At 37 feet to the north, a shaft on the Gladstone belt is being kept unwatered to a depth of 40 feet from surface, this serving to keep the surface water out of the main shaft. The operations on the "Big Lead" were extended since the last inspection, until the following underground appearance is shown:—

At 425 feet the levels are now in west 117 feet and east 78 feet, and the cross-cuts here were continued south to a distance of 37 feet, and north to 111 feet, cutting the McKenzie lead in the former and the "Gladstone" and "McClure" belts in the latter.

Drifting was done on the "McKenzie" for 25 feet each way from head of south cross-cut.

Ore was extracted by the overhand method on the "Big Lead" from the end of the west drift to a point in the shaft 300 feet from the deck.

A small amount of underhand stoping was also done at this shaft between the sump and these levels.

Good ore was encountered in the shaft at 275 feet, and the pitch of the rich streak in this belt is supposed to be about  $36^{\circ}$  westerly. It is the intention therefore to drift on this shoot of ore.

The chief work, however, at the time of my visit consisted in exploiting the ground on the "Gladstone Belt," some 700 feet west of the above shaft. The belt at this point produces about 2 feet of milling ore—slate and quartz.

An old shaft, situated here and 130 feet in depth, has been pumped out to within 60 feet of the surface, and at 40 feet a drift is being run west to cut a pay-streak and to connect with a shaft 100 feet further west, which is just being sunk and is now down 150 feet. A level has been commenced west, and is to be continued for 200 feet, in which distance it is expected to intersect another pay-streak, where, if the ore proves satisfactory, a main deep shaft will be sunk. The pay-streaks in this vicinity appear to all pitch westward at  $36^{\circ}$  while the rock dips to the northward at about  $43^{\circ}$ .

Hoisting is done in the first mentioned of these two shafts by a small engine, and at the latter by a "whip." The mill, a new one, is installed with thoroughly up to date plant, and contains 10 stamps, ore bins, rockbreaker, grizzly automatic feed and a Wilfley concentrator. Power is supplied by a boiler and large engine.

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*New Glasgow Property.*—George Hirschfield and several men are tributing on this property and are sinking on the Meridian lead to the south.

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#### WINE HARBOR.

*The Plough Lead Mining Co.*—J. S. Lowe, general manager, M. McGrath, superintendent, and 35 men. The company is working at two points in the district.

On the "Plough Lead" two shafts have been sunk. In the west shaft, which is 190 feet deep, a level driven west at 50 feet in the shaft has encountered the large main fault which crosses the rock in a north and south direction and dipping east passes through the shaft at 180 feet. West of this fault the continuations of the measures lie about 80 feet to the south. Another fault intersects the first in the level. The strike of this has a south-easterly course, and thus a triangular "jib" lies between the two, and in this ground the rock is much broken and shaky.

It was in the western end of this bad ground that the old open cut workings had been driven when the ore was lost several years ago. A cross-cut was made from the shaft at this 50 foot level for 60 feet in a south-west direction, and from a point in it, 30 feet from the head, an offset was driven north-west to the "Westcassett" vein, which though in reality underlying the "Plough" lead, is here found south of the portion being worked, having been moved there by the heavy "shove" just mentioned.

This west shaft is sunk on a small hanging wall vein and at the surface does not cut the main belt, which here takes the form of a large "chimney," 60 feet to 70 feet in height, 20 feet or more in thickness, and containing perhaps about 60% of milling stuff. This pitches to the east at an angle of about  $18^{\circ}$  and also to the south. It has been followed east for 180 feet, and the face at this point lies 40 feet west of the east shaft, a new one, which is sunk on the footwall, and has reached a depth of 90 feet. This will be deepened to catch the pitch of the ore, and a pillar is to be left between the roof of the present workings and the west side of the shaft. Two blocks of stoping have been carried for 60 feet west of the west shaft. The method of timbering used is that usually adopted in our gold mines (stull and scaffold) though necessarily on a larger scale than is generally the custom. The cross-stulls in places measure 25 feet in length. No props are used, as little rock is placed on the scaffolds and the ressure is chiefly lateral. The shafts on this belt dip at  $87^{\circ}$  south.

The company has also opened a shaft on the "Eureka" lead nearly a mile to the east. This vein measures four to five inches in thickness, and is contained in a "whin" working belt of about 36 inches.



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This shaft is 30 feet deep and dips like the above at  $87^{\circ}$  to the south. One lift of 40 feet has been taken out at the bottom level. Operations are conducted by means of a "whim." The mill is situated at the "Plough" lead works, and contains 15 stamps, weighing about 800 pounds each. A 40 H. P. engine is used for hoist and pump and a larger one for the mill. The boiler is of about 30 H. P. capacity.

W. L. Pratt, a Boston capitalist, is operating at three separate points on what was originally known as the "Old Provincial" property.

Between 600 and 700 feet east of the "Plough Lead" works a shaft is being sunk on the south dip to tap the ore body being worked by the above company, which as already mentioned is pitching to the east. This shaft, 13 feet by 4 feet inside timbers, is down 30 feet, and it will probably be necessary to reach a depth of over 200 feet before the ore is reached. One steam drill was used in this sinking. A little further east and to the south of this shaft the old workings on the Caledonia belt have been partially reopened.

A shaft on this vein, some 200 feet deep, has been cleaned out for a depth of 70 feet and connection made with another shaft over 100 feet to the eastward, and on the same belt, west of the first mentioned shaft, the ground had all been stoped out some years ago, and between the two shafts and east of the east shaft it had also been worked away for 75 feet.

A level was driven at 180 feet in the shaft and had reached a point 75 feet east, and the new work done by the present management consists in stoping from the shaft bottom to the head of this level, and a winding cross tunnel driven diagonally across the measures in a south-easterly direction for 170 feet. This tunnel was driven from the end of the level, and has as yet cut no valuable ore. No further driving on the main belt was done to prove its continuation.

The mill, which is situated over this east shaft, contains a 5 stamp battery, which is shortly to be enlarged to 10 stamps. These stamps weigh 950 lbs. Water for the battery is obtained from a brook and swamp, except in very dry weather, when salt water was used. The swamp water also supplied the boiler, which is 60 H. P. and drives mill engine, hoist and pump. North of the road and near the school house a shaft, sunk by means of a "whim," is down 50 feet, and cross-cuts have been driven north 15 feet to intersect the "Hattie & Mitchell" lead, worked some years ago to the west, and south 30 feet on a prospect.

The former work has not yet reached the desired point, while in the latter tunnel a small vein was found 15 feet from the shaft.



Mr. Conroy is acting as manager with R. McDonald as foreman and 23 men employed. Mr. Weston is also on the ground in Mr. Pratt's interest.

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ISAAC'S HARBOR.

*The Richardson Gold Mining Co., Limited.*—This large and what may well be called representative producer has passed through several misfortunes in the shape of "crushers" during the past two years, and though a large part of the old upper workings on the south leg of the anticlinal were lost, the mine is now on a most systematic basis for development. Pillars are being left over the levels, and heavy and close timbering is resorted to, this latter being carried as close to the working places as the firing will allow.

The main shaft has reached a depth of 620 feet, measured on the incline, which is on an angle of  $22^{\circ}$  to  $25^{\circ}$  for 100 feet, and from there at about  $35^{\circ}$  to the bottom.

A drift from the 500 foot level is in on the south leg for about 700 feet and thickly covered with timber to within 160 feet of the head, from which point a solid rock cover is left between it and the old crushed upper workings. This pillar measures about 70 feet in height.

At 530 feet from shaft in this level a mill hole is down to the face of the underhand stopes being carried from the shaft bottom up to the level, and between the level and this working, two pillars, some 40 feet long by 30 feet high, have been left. Though the roof is apparently secure at present, in order to prevent a spread of the crush by which the main shaft might be lost, I recommended that false pillars be placed along the upper side of shaft. Rock filled cribs or chocks would be a cheap means of effecting this, though perhaps solid masonry, cement or concrete, would be a better and more lasting method. The north shaft has reached a depth on the incline of 240 feet, but on account of its steepness of dip, which increases from  $65^{\circ}$  to  $80^{\circ}$ , the bottom is only some 50 feet above the level of the bottom of the main east shaft, and about 350 feet from it, measured round the bend, which here appears to be more gradual than the fold formed by the south leg. Underhand stoping has been carried up from the shafts to a point between them, from which point the ore is sent in opposite directions to the skips in the respective shafts.

The level driven from the bottom of the north shaft northwesterly has now reached a distance of 220 feet, and from its head a vertical bluff to the surface marks the limit of the work in this direction. As stated above, besides the heavy timber put in there, regular pillars have been left all the way round above the level from the main shaft

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to this face, and this system, the underground manager informed me, was to be rigidly adhered to in the future workings of the mine.

Two Rand air machines are used in drilling. The thickness of the ore body round the bottom level varies from  $4\frac{1}{2}$  feet to 15 feet and it contains approximately an average of 60% to 70% of quartz. The concentrates average about  $1\frac{1}{2}\%$ , and are said to be worth over \$30.00 per ton.

The mill which formerly contained 40 stamps is now enlarged by 4 more batteries, making 60 stamps in all, and two more Wilfley tables having been added, bring the total number of concentrators up to 6.

Steam drilling has been superseded by the installation of a large 12 drill air compressor, and a 100 H. P. boiler with the old one of 60 H. P. supply the 160 H. P. engine.

Extensive changes are contemplated at the deck-head. The shafts, which vary in angle and slope between the surface and bottom level, are to be carried up from the latter point on an even inclination, thus shifting the position of shaft house and collar further west. The deck will thus be raised considerably, while a grizzly and additional rockbreaker of the Gates pattern for finer crushing are to be installed here.

A new 100 H. P. boiler has been recently placed in the shaft house, and supplies a 30 H. P. engine, which runs a large size Blake rockbreaker and pump.

The water for this boiler is taken from the pit and is used again by means of a condenser.

A new wharf has just been completed, from which a track is being laid to the shaft house, about 8000 feet to the east, and is to be extended to the mill another 1000 feet east of the shaft. This will greatly facilitate and reduce expense in transportation of supplies, such as coal, etc., and it is expected will assist in paying for itself in wharf rates. A small steam locomotive will give the necessary motive power.

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*Dolliver Mountain Mining Co.*—G. J. Partington is in charge of operations with Dan. McAskill as foreman. Only twelve men are employed at present, as the company's workings have, up to now, not been extensive, being chiefly confined to prospecting and development on the surface at a point some  $1\frac{1}{4}$  miles from the Richardson Company's workings.

A vertical prospecting shaft, 12 feet by 6 feet, has been sunk here

to a depth of 60 feet, and sinking will rapidly be pushed to cut belts on the turn inside of and similar to the large ore body being worked by the above company.

Two of these veins, measuring 5 feet to 8 feet in thickness, have been proved on the surface, one 500 feet west, and another about the same distance east of the shaft just mentioned. It is evidently the intention of the company, which I am informed is largely capitalized, to greatly increase the field of operations in this prominent district. A wharf has been built near the head of the harbor, and a road from it to the mine, a distance of half a mile is being laid out. As water power is to be used, a very low grade of ore can be treated at a profit.

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#### FOREST HILL.

*Strathcona Mining Co.*.—This company is the only one at present operating in the district.

C. McDonald is manager, and has 50 men employed, the majority of whom are working on the surface.

The belt on which mining is being conducted contains 13 or 14 inches of milling stuff, about 50% of which is quartz.

The main shaft, called the "Compressor" shaft, is 200 feet deep, and from a depth of 135 feet to surface underhand stoping has been carried east 300 feet and west 175 feet.

Near the bottom of this shaft a level has been carried east 300 feet and west 175 feet. Near the bottom of this shaft a level has been driven east for 90 feet and a small block of ore, 40 feet in height, taken out by the overhand method near the shaft. At a point, 500 feet east of these workings a new shaft, 14 feet by 4 feet, inside timbers, is being sunk to cut the pay streaks, which pitch eastward at about 60°, and are well defined in the other mine.

Some little work is being done here and in an old shaft 25 feet further east, which is connected underground. A "whim" is the means used for hoisting at present, but the old plant at the "Compressor" shaft is to be moved here, and an improved plant will be substituted in the new shaft house now in course of construction.

This new plant will also do the necessary work at an old shaft on the Ophir lead, being opened to the north.

## UNIACKE.

*The Great Belt Mining Co.*—This new company, which is capitalized at \$500,000, is operating the old quarry works on the property known as the "British American." Mr. Prince, the manager, was away at the time of my visit; but as the mine had been recently unwatered, an opportunity was presented of examining the pit. The large open cut is divided north from south by a belt of whin several feet thick, running east and west, and it is on the northern side of this that operations are being conducted. This hole gives the following approximate measurements: At top it is 100 feet long by 30 feet wide, and between 60 and 70 feet deep; at the bottom it is about 25 feet long and 30 feet wide; on the north side of the working lies a slate belt, 15 feet in thickness, intercalated with small veins and stringers of quartz, and a few bands of whin. Most of this belt will go to the mill. Of the remaining 15 feet probably between 3 and 4 feet, or say 25%, will be crushed. I understand the intention is, when another stope of about 20 feet is taken out at the top, to cut the east face down square, and to do the same at the west end. Sinking will then be prosecuted to meet the old workings said to be over 100 feet below the quarry bottom. A cable hoist with a large car of  $1\frac{1}{2}$  tons capacity is used for extracting the rock which will be picked on deck. A shaft to the north is kept unwatered, and being connected with the old workings on the south side of the large "Whin" belt, the pit is kept dry.

One Rand steam drill is used in breaking down. This drill and the pump and the hoist are supplied by an auxiliary boiler set up outside.

The mill which formerly contained 10 stamps now has 30 in position, 20 of which were running at the time of my visit. This building contains a 50 H. P. boiler and engine.

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*National Mining Co.*—John Kenty is manager, and 18 men are employed underground and on the surface. Work was commenced on the Prince of Wales lead in July, 1900, at which time the shaft was 100 feet deep. It has now, including the sump, attained a depth of 240 feet. At 100 feet in the shaft an incline, 16 feet high, has been driven following a rich shoot which pitches at about  $60^{\circ}$  to the east. On the west side of the shaft at the same depth, a level has been driven 30 feet and stoping carried from its head to the surface.

A 5 x 3 x 6 Northey pump lifts the water from this level up to the surface, and it is brought from the bottom to this level by another pump. At 170 feet a drift has been made west 130 feet, and from a point near the end an upraise has been driven for 25 feet, following another rich zone which dips in the same direction, and at about the same angle as the shoot mentioned above. Between these two it is



supposed (from tests of ore in the shaft) that another parallel "chimney" exists.

At 205 feet, vertical, a level east passes through the incline which extends to a distance of 30 feet below this point.

Most of the ore has been extracted from the block enclosed by the level, the incline and the shaft.

At 29 feet from the shaft in this level cross-cuts have been made north 30 feet, and south 11 feet.

It was originally intended to produce this north cut to intersect a vein, known on the surface; but the lead was ascertained to lie on the adjoining claim.

The working belt, consisting chiefly of slate, is about 30 inches in width and contains from 3 inches to 6 inches of quartz.

The shoot of ore worked by the incline contains a large percentage of arsenical iron. In the workings on the "Queen" lead, 123 feet south of the "Prince of Wales," and several hundred feet west, the shaft has reached a depth of 148 feet. Levels have been driven at the following depths and distances:

At 30 feet a level is in west	-	-	-	-	25 feet.
At 20 " " " east	-	-	-	-	60 "
At 120 " " " west	-	-	-	-	60 "
At 125 " " " east	-	-	-	-	75 "

A block has been stoped out west of the shaft at 120 feet for a distance of 25 feet and a height of 40 feet, and on the east side breast-work has been carried from the 125 foot level practically to the surface and for a length of 60 feet.

At 15 feet from shaft, in the 70 foot level, a cross-cut connects with the Prince of Wales lead, 123 feet north, and driving has been done on this vein for 115 feet east. This is being extended by a couple of men to cut a pay shoot further east.

A large Northey pump is used for unwatering the mine, and a boiler and hoisting engine are installed in the shaft house. At the Prince of Wales shaft another boiler and engine is employed.

A small Tremain crusher containing two steam stamps is used for testing.

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*Westlake Property.*—On these areas Messrs. Archibald & Crease are working a 22 inch belt, containing two small leads, which together average about 5 inches of quartz. John Bryson is in charge of operations, and has 13 men at work. The main shaft is 100 feet deep and



at the bottom a level has been driven east 35 feet. A few feet from the shaft in this level a cross-cut has been made in the hanging wall for 18 feet.

Another shaft, 64 feet west of the main opening, is down 75 feet, and the ground between these is all worked out.

A block 40 feet long has been has been stoped west of the west shaft, and a drift extended west for 150 feet at the 75 foot level.

An interesting occurrence may be noted in this mine at a point half way between the two shafts. Well marked and distinct striations on the footwall show a dome like formation with the rock pitching each way at low inclinations from this point. Very probably, if studied, this peculiarity would give a key to the segregation of the ore values. At the main shaft a small hoisting plant is in use while a steam pump is employed in the mine. The ore is crushed in an 8 stamp mill.

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#### EAST RAWDON.

*The Gold Zone Mining Company.*—This company has recently commenced operations in this district (which has been practically abandoned for a number of years) and have pumped out the workings on the "McNaughton" lead, which have been full of water for 14 years.

The mine has been opened by 4 shafts at intervals of 100 feet apart.

No. 1, the most easterly, is 360 feet deep.

No. 2 is 460 feet deep.

No. 3 is 430 feet deep.

No. 4 is probably about 150 feet in depth. These measurements are on the dip, which is about 45° to the north.

All the ground has been worked out between shafts Nos. 1 and 3, and between 4 and to a depth of 270 feet in No. 3.

At 330 feet in No. 3 a drift has been made easterly on a slight pitch for 200 feet, and the ground between its head and the bottom of No. 3. shaft has been stoped out.

At the 60 foot level, and about 20 feet west of this shaft, a cross-cut has been driven north through the hanging wall for 100 feet, cutting the north lead, which at this place has apparently sprayed into several small stringers.

A curious phenomenon may be noticed here. When the mine was pumped out, after lying 14 years full of water, a crush was found to have been sustained, which buckled and split heavy timbers over 18 inches in diameter. This was not a local movement, but one which brought the whole hanging wall in the mine several inches nearer the foot-wall, and yet no split or parting can be observed in the 100 foot section, (including several slate belts) exposed in the cross cut.

The intention is to sink the main or No. 2 shaft to cut lower shoots of ore, which, though apparently affected more or less by the series of small faults occurring in the mine, are fairly well defined and have a general pitch to the west. The plant includes two Northey pumps, a large boiler and engine, brought from England by the Rawdon United Mining Co., upwards of 20 years ago, and two steam drills, one Rand and one Ingersoll. This boiler supplies the hoist, pumps and drills. The old 25 stamp mill is to be remodelled.

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RENFREW.

*Big Five Mining Co.*—J. D. Horne is in charge of this mine, and has 9 men employed. The shaft, which is sunk on the dip (about 45° S. W.) has reached a depth of 156 feet. All the work except a small block of stopping near the top has been done on the belt south-east of the shaft.

No. 1 level, at a depth of 70 feet, is in 64 feet, at which point the division line between this and the "Thompson" mine on the same belt, is encountered, and connection made between the workings.

At 30 feet from shaft in this level the cross-cut, which had just been commenced at the time of my visit last year, has now been extended to a distance north-east of 155 feet, and has intersected some 8 veins, the majority of which, though not showing visible free gold, have not been given a test by mill or assay. This cut is also in 20 feet south where it meets the "Thompson shaft."

No 2 or the 100 foot level is in east 56 feet, and has also reached the division line where connection is again made.

A drift easterly from this level has followed the course of the division line for 36 feet, and intersected two of the veins found in the upper north-east cross-tunnel.

No 3 or the 150 foot level has likewise reached the division line at a distance from shaft of 35 feet, and it will therefore be apparent that the course of the dip on which this shaft is sunk is bringing it nearer this line, as depth is gained. A sump of 6 feet has been left below this last level.

All the ground up to the division line has been stoped out with the exception of two pillars at the shaft. The highest of these, between levels Nos. 1 and 2, is 40 feet, and 10 feet long, and the other, between levels Nos. 2 and 3, is 50 feet in height, and from 15 to 20 feet long. No values are supposed to be contained in these, as they lie below the pitch of the rich zone, and so far has been proved no pay ore lies on the north-west side of the shaft. It appears from the above description that alternatives presented themselves of either abandoning these workings or exploiting the ore opened up in the cross tunnels.

This latter course, I am informed, is to be adopted, and even if the ore is only of a medium grade, several of these being worked together should pay well.

The original small plant is still in operation at this mine.

Up to the present it has been found unnecessary to use pumps as the workings are drained by the adjoining pit.

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*E. Thompson's Mine.*—C. Thompson is in general charge with J. Robinson as Superintendant, and A. McDonald as underground foreman. Thirteen men are employed.

The shaft is vertical for 65 feet, and from there is sunk an additional 75 feet on the vein. It is situated about 80 feet from the above company's shaft, and south-west of the outcrop. The division line between this property and that of the Big Five Company, crosses the shaft at a depth of about 75 feet; and thus the ground at present west of the shaft is practically not available, though its extent increases as depth is gained. On the east side of shaft a level has been driven 78 feet to a large cross sectional fault, which occurring close to the shaft at the surface pitches rapidly to the eastward and throws the eastern portion of the vein 24 feet to the south. This fault has been followed to the belt which has been driven on for 15 feet easterly. Although west of the fault, it contains two leads comprising 3 to 4 inches of quartz, only one of small size continues beyond the break.

From the head of this level the ground has been backstoped to the surface, and the ore has also been worked out below the level to the shaft bottom by the underhand method. A 20 H. P. boiler supplies the Cornish pump and hoisting engine.

The returns from this mine from May, 1900, to August, 1901, a period of less than 12 months show that 452 tons yielded 5,470 ounces, valued at upwards of \$104,000.00, or about \$230.00 per ton.

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BLOCKHOUSE.

*Blockhouse Mining Co.*—Though operations have been continuously in progress no official report has been issued since Sept., '99.

C. McClair is still in charge, with C. Anderson as assistant, and 14 men on the shift.

As stated in my last report, the vein being worked is a fissure with an average thickness of about 8 inches. Its strike is N. 13° W. with a westerly dip of 70°. No. 1 or the "Mill" shaft is now 110 feet deep, and No. 2, situated 66 feet to the southward, is 144 feet deep.

Another shaft down 46 feet is sunk on the vein 116 feet northerly from No. 1.

At 64 feet in the mill shaft an incline was commenced and on a pitch of 40° south on the vein, has now reached a depth of 200 feet, measured on the slope.

All the ground between the shafts has been worked out and south of No. 2 a large block has been stoped away which measures in length as follows:—At surface, 125 feet; in shaft, 225 feet, and from bottom of incline 136 feet

A triangular block of ore has been left in between the 100 ft. level (where it measures 109 feet in height), and the head of the bottom level.

The pay streaks appear to pitch south following a series of small cross slips which lie at an angle of about 40°. One of these can be seen in the overhead stopes in the upper south workings, and another is followed by the incline. Along the bottom level a fault occurs lying at a gentle inclination to the north, and throwing the vein 12 feet into the hanging wall

A winze is to be sunk here 100 feet to work the ore below the level.

The changes in the plant include a 4 drill air compressor, supplying a machine drill, and one Wilfley table for the concentrates.

On the 13th of September an accident occurred at this mine by which N. White lost the index finger of his right hand, it having been crushed by the drill column.

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LEIPSIGATE.

*The Micmac Mining Co.*—This company having purchased the property owned by Messrs. Cashion and Hines, are developing the old workings on the fissure vein. T. W. Moore was in charge with E. H.



Preswick as underground foreman, and 13 men employed. Work was commenced by the new staff on April 15th, 1900, and workings now present the following appearance:—

The main or middle shaft has reached a depth of 220 ft. and from a point 160 ft. from deck, the ore has all been extracted to another shaft 100 ft. south-west of above, and 80 ft deep. South-west of this latter shaft, back-stoping has been carried from surface to a distance of 150 feet from shaft at the 80 feet level. At the 175 feet level in the main shaft, a drift is in north-east for 150 feet, and the vein is stoped out above it, and between the main and another shaft 75 feet to the north-east. It appears that the pay ore in this mine lies in a series of shoots or chimneys, averaging 25 feet in height and 3 inches in thickness, dipping north-east at  $9^{\circ}$ , and occurring at intervals of 5 feet to 10 feet apart.

The old rope transmission from the mill has been done away with, and at the main shaft a 25 H. P. boiler supplies a Ledgerwood hoist and two steam pumps, a "Northey," which lifts from the sump to a cistern, and a "Blake," which unwaters from there to the surface. One 10 hour shift is employed in the mine and the 10 stamp mill crushes night and day.

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*Nova Scotia Development Co.*—C. N. Crowe, formerly foreman at the Brookfield Mining Co., is managing operations here, and with 17 men, is working the old "German" property, so called. This mine, which is supposed to be situated on the fissure vein, worked by the Micmac Co., lies over a mile to the westward of their workings. The vein dips to the north, the angle varying from  $65^{\circ}$  at the surface to  $80^{\circ}$  at the bottom of the shaft, which is 125 feet deep. Levels have been driven here west 37 feet and east 40 feet, and between the depths of 43 feet and 73 feet, blocks of ore have been extracted to lengths of 40 feet on the west side and 160 feet on the east side of shaft.

In the latter place a connection has been made with some old workings opened by a shaft some 250 feet east of the main shaft.

One of the chief difficulties encountered by the old company in working this mine was their apparent inability to cope with the water. This comes largely from the surface, especially in the wet seasons. Mr. Crowe, to obviate this difficulty, has raised the shaft collar some 6 feet, and caulked the cribbing to a point below the rock, and has further drained the surrounding low ground by a trench several hundred feet long.

A boiler and steam hoist have been installed at the shaft and the old roller mill has been dismantled.



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VOGLER'S COVE.

*East Eagle Mine.*—T. Cameron and 12 men are working here. A shaft has been sunk on a large vein, crossing the strata and measuring some 9 feet in thickness at this point. The strike of the vein is a little west of north, and the shaft is down 120 feet on the dip which is at a fairly steep angle.

At 90 feet a drift has been run northerly on this large quartz body for about 40 feet, and on the other side of the shaft the drift is in 48 feet. About half way to the face of this latter working, the direction has been changed and another vein about 2 feet in thickness has been followed while the large lead is still apparently in the west wall. About 35 feet south from the 120 feet shaft a sink of 65 feet was made in 1899 on the smaller lead, and a drift made south from the bottom for an additional 35 feet. This working, is of course above the present place.

A boiler, hoisting drum and steam pump comprise the plant at this mine.

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## MILLS' VILLAGE.

*Gold Eagle Mining Co.*—Work was stopped at this mine on September 1st; the reason given being scarcity of fuel and water. However the workings have been kept pumped out, and have reached the following state of development:

The shaft is 190 feet deep and the 110 feet level has been extended west to 220 feet and east to 110 feet. On the west side of the shaft, the ore has been back stoped from near the surface to a point 15 feet from the head of the level, and on the east side it has been worked out to a vertical face 115 feet from shaft. At 100 feet east of shaft an air shaft connects this level with the surface. The cross-cuts at the intersection of this level with the shafts have reached the following distance:—south 65 feet and north 62 feet. From the face of this latter cut, a diamond drill hole was bored for an additional 60 feet at a slight dip from the horizontal. Although two veins, the "Battery" lead 4 inches thick, and 65 feet north of the lead being worked, and the "Zwicker" lead, 5 inches thick, and 30 feet further north were opened at the surface, neither, I am told, were encountered by the cross-cut or bore hole.

A shaft has been sunk 20 feet on the Zwicker vein, and a cross-cut driven south 33 feet.

In the main shaft two pillars have been left on the west side; one 60 feet high by 15 feet long, and the other 20 feet high by 15 feet in length.

The vein averaged, so far as could be seen by the faces, exposed from 4 inches to 5 inches of quartz, and the belt is about 33 inches wide, though towards head of the west level it narrows down to 20 inches.

The mill is of 10 stamps with a capacity for 10 more, and contains a grizzly Blake rockbreaker and automatic feed, and one Wiltley concentrator.

A large boiler supplies the 45 H. P. mill engine and 20 H. P. hoist. Another boiler is used for the 3 drills (2 Sullivan and 1 Rand), and the pump; a No. 3 Cameron.

A large electric light dynamo supplies the lights used in the mine and buildings, and on the roads. These I was told numbered 65.

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#### FIFTEEN MILE BROOK.

*Lowe Bros.' Property.*—On this property J. McGrath, as manager, and 11 men are working a slate seam containing a 4 inch vein of quartz in a working belt of "whin." The shaft, which is 70 feet deep, dips slightly to the south, and has been sunk through the foot-wall 10 feet behind the vein.

At the 50 foot level in the shaft a place was broken out west for 10 feet, from which point cross-cuts were driven north 18 feet, and south 10 feet to the vein, on which a drift was made 50 feet east, and 10 feet west. At the west face of this drift another cross-cut south was driven 30 feet, and in it a small vein, folded directly over, in anticlinal form, was cut. On further development it may be proved to be the case that though the rock is dipping to the south, an overturn has occurred, and this underlie is really on the north leg of the main fold.

At the time of my visit they were breaking through the hanging wall at shaft bottom to tap the vein. Considerable timber will be necessary here to support the heavy mass of overhanging rock in the roof.

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#### NORTH BROOKFIELD.

*The Brookfield Mining Co., Limited.*—Two years having elapsed since an official visit was paid to this mine, much progress was noted in the underground development. Nearly 1600 feet of sinking and driving has been accomplished, and some 16000 tons of milling ore produced by the increased workings. W. L. Libbey is general manager, with A. S. Crowe as underground foreman.

The company employ 80 men as miners, millmen and on the surface, and work 2 shifts of 10 hours each.

The following notes will show the extensions of levels etc., to date, when by comparison with the last report on the mine, the progress may be seen. The incline is driven on the vein at an angle of  $35^{\circ}$  westerly, and has reached an actual distance measured on its pitch of about 1700 feet:—

Level No. 5 at a depth of 470 feet is driven west 460 feet.

" 6 " 525 " 440 "

" 7 " 582 " 440 "

and east 70 feet.

Level No. 8 at a depth of 642 feet is driven west 490 feet.

" 9 " 702 " 260 "

and east 90 feet.

Level No. 10 at a depth of 762 feet is driven west 80 feet.

These depths are measured on the dip of the vein.

As will be seen no additional work was done in the upper levels above No. 6.

The vein appears to vary considerably in size at the faces of the levels as will be seen by the actual measurements taken.

In No. 5 level, vein is split up into stringers.

" 6 " it shows about 6 inches of quartz.

" 7 " it is split up.

" 8 " it measures 5 inches.

" 9 " it is split up.

" 10 " about 18 inches of quartz is shown.

At bottom of incline vein measures about 2" of quartz.

The above figures refer only to the actual quartz in the belt, and does not include any black rock that may be milled with it.

Three pumps, two Northey and a Cameron, are installed in the mine, though only two are used. At shaft house over the incline a 35 H. P. boiler supplies these pumps and a 30 H. P. hoisting engine which supplants a smaller engine used previously. Little change has otherwise taken place in the plant, which includes the air compressor, a 40 stamp mill, 8 "Triumph" concentrators and the large chlorination plant. Rand air drills of the "Slugger" (No. 32) type are in use at the mine. The Company have recently completed about three miles of log tram road to their timber limits.

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#### KEMPTVILLE.

Considerable capital it is said, has recently become interested in this district, development work is proceeding with the expectations that shortly large mining operations will be actually in force.

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*The International Mining Co.*—This New England corporation are mining in the western part of the district, and employ T. C. O'Neil as manager, Alex. Fraser, foreman, and 16 men.

On the "Cowan" lead, a shaft is down 90 feet on a dip southwest of 80° and 70 feet deeper on a slightly overlying angle to the bottom, making the total depth 160 feet.

At a depth of 90 feet a drift has been run on the vein for 60 feet north east, and from the face underhand stoping has been carried to the surface. On the opposite side of the shaft the ore has also been extracted to the surface by the same method. At shaft bottom a level is in 37 feet westerly, and from its head cross-cuts northerly 160 feet and southerly 50 feet have been driven. At 36 feet in the south tunnel a large ore body extending to the face was encountered. This has been named the O'Neil belt, and a pit 15 feet deep has tapped it at a point 235 feet westerly from the shaft on the surface.

The north cross-cut is being driven to intersect a large belt 220 feet to the northward.

The shaft house contains a 60 H. P. boiler which supplies the pump, hoist and the low pressure half of a 6 drill air compressor, which runs 2 machine drills employed in the cross-cutting work. As will be observed little but exploiting has as yet been done. The mill, though containing 15 stamps, is old fashioned, and will be completely remodelled.

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*The Argonaut Mining and Milling Co.*—E. F. Walton, Manager, W. Rice, Underground Manager. A new vertical shaft 90 feet deep intersects a large belt at 60 feet. This belt is in the form of a shoot pitching westerly, and at this point contains about 13 feet of milling material, which at the last crushing, and under unsatisfactory milling conditions, gave over 11 dwt. to the ton. A cross-cut north from here connects with the old workings on the "Nash" lead and has also cut several other good looking belts. The main belt, which appears to be split up, and in a very irregular shape here, has been worked out east for a distance of 155 feet to an old shaft 70 feet deep.

The present intention is to sink the vertical shaft for an additional 150 or 200 feet when it is hoped that the shaky and broken nature of the ore deposit and accompanying walls will be overcome, and regularity prevail. Very possibly this shaft will when depth is gained run out of the thick ore until another shoot or chimney is reached. The mill which is primitive and inefficient in its equipment contains 10 stamps. A Blake rock breaker and an improvised automatic feed, also form part of the plant.

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A 45 H. P. boiler and 35 H. P. engine supply power for the hoist, 2 Worthington pumps, rockbreaker and stamps; and run a small Ingersoll compressor. One Rand drill is employed underground.

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CRANBERRY HEAD.

*Cream Pot Mining Co.*—J. D. Huntington Agent. This mine has been practically idle for the past 2 years.

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The two tables annexed are self-explanatory, and give mill details in some of the districts and approximate prices of mining commodities, which may assist in making rough estimates.

I remain,

Yours obediently,

D ARCY WEATHERBE, C. E.



## APPROXIMATE PRICES OF LABOR, FUEL, ETC., IN NOVA SCOTIA GOLD MINES.

DISTRICT.	WAGES OF MINERS.	KIND OF FUEL USED.	PRICE OF FUEL.		PRICES FOR MINE TIMBER.		
			Per Cord.	Per Ton.	Stalls.	Remarks.	Scaffold Poles.
			\$ c.	\$ c.			
Lake Catcha.....		Wood.	1 30	3 c.	3 cents	Per running ft., 9 ins. at small end.	\$5 00
Tangier .....		Wood.	2 40	25	\$2 25	Per cord	
Moose River .....		Wood.	1 60	50	5 00	Per 1000 ft., log meas., 12 ins. and upwards.	3 00
Caribou .....		Wood.	2 00		3½ cents	Per running ft., 12 ins. at small end.	5 00
Harrigan Cove. ....		Wood and Coal.	2 25	4 25	4 "	Per running ft., 9 ins. at small end.	5 00
Goldenville .....		Coal.	.....	4 35	5½ "	Per running ft., 10 ins. at small end.	5 00
Wine Harbor .....		Coal.	.....	4 50	5 "	Per running ft., 8 ins. at small end.	4 50
Upper Seal Harbor .....		Coal.	.....	4 70	4 "	" "	3 00
Forest Hill .....		Wood.	2 00	2 "	4 "	" "	4 00
Waverley .....		Coal.	.....	4 "	4 "	" "	5 00
Leipsigate .....		Wood.	2 40	2½ "	2½ "	" "	.....
Uniacke .....		Wood.	2 50	3 "	3 "	Per running ft., not less than 6 ins.	Per 100, 12 ft. 1 g.
Brookfield .....		Wood.	1 80	2 "	2 "	Per running ft.	Per 100, 16 ft. 1 g.

\*This wage is for muckers, etc., machine men and foremen generally getting more.

## SUMMARY STATEMENT SHEWING MILL DETAILS IN SEVERAL DISTRICTS.

DISTRICT.	MILL.	Motive Power.	No. of Stamps.	Capacity of ore bins.	Grizzly Used.	Pattern and Size of Rock Breaker.	Is an Automatic Feed Used.	Weight of Stamp.	Material of Stamp Parts.			Are Slide Plates used in Battery.	Nature and No. of Screen.	Pattern and No. of Concentrators.	Approx. Cost of Milling.
									Shoes.	Dies.	Heads.				
Waverley.....	G. Mg. Co.	Water.	60	350 About.	Yes.	Blake, 9 x 15.	Challenge & Hammond.	950	Steel.	Steel.	Cast Iron	No.	Mesh, 24 to 26.	4 Wilfleys.	\$ 30
Storment .....	Richardson	Steam.	60	300	None.	Blake, 10 x 7.	Hammond.	1000	.....	.....	.....	Yes.	Mesh, 24.	6 Wilfleys, 8 Improved Triumph.	50
North Brookfield	Gold Mg. Co.	"	40	80	"	Dodge, 10 x 15.	Challenge.	900	Chr	ome	Steel.	No.	.....	1 Willey.	60
Tangier .....	Worcester	Water & Aux. Stm	20	50	"	Gates.	Yes.	"	Cast	Ir	on.	.....	Mesh, 21.	2 Free Vanners.	.....
Moose River .....	Touquoy G. Mg. Co.	Water.	15	None.	None.	None.	None.	850	"	"	"	Yes.	Mesh, 21.	1 Willey.	40
Harrigan Cove .....	St. Anthony G. Mg. Co.	Steam.	10	35	None.	Blake, 9 x 15.	Hammond.	850	"	"	"	"	Mesh, 28 to 30.	1 Willey.	1 00
Blackhouse .....	Blackhouse G. M. & Co.	"	10	22	Yes.	Blake, 5 x 7.	Yes.	750	Chrome Steel.	"	"	"	Mesh, 32.	1 Willey.	1 01
Sherbrooke .....	Blenhose	Steam.	30	125	None.	Dodge and Dodge, 7 x 9.	Yes.	950	Cast	Iron.	.....	.....	Mesh, 21 to 30.	2 Wilfleys.	.....
Sherbrooke .....	Royal Oak Mg. Co.	"	"	35	"	Gates.	Challenge.	"	Ste	el.	Cast Iron	Yes	Mesh, 24.	1 Willey.	85
Leipsigite.....	Black Hawk M. Co.	Steam.	10	65	Yes	Blake.	"	950	Forged	Steel.	"	"	Me-b, 24.	2 Wilfleys.	1 50
Lake Catcha .....	John Anderson's.	"	"	None.	None.	None.	"Frenchman"	850	Ste	el.	"	"	Mesh, 24.	None.	1 00
Moose River .....	Moose River G. M. Co.	Water.	10	"	"	"	None.	700	Ca	st	Ir	No.	Mesh, 24.	"	50
Mills Village .....	Gold Eagle Mg. Co.	Steam.	10	20	Yes.	Blake, No 2.	Disc. Pattern.	850	I	ro	n.	Yes.	Mesh, 24.	1 Willey.	.....

\*These figures were supplied by the Managers.

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**LEAD.**—At the Cheticamp Mining Co.'s property, at Cheticamp, the following work has been performed:

The main slope has been driven a distance of 112 feet from the line of the outcrop, 9 feet in width and 18 feet in height, the cubic contents of which contains upwards of 2000 tons of rock; for the first 60 feet nearly all of the material removed was barren or void of metallic sulphides, which it was found necessary to mine in order to open up or attack the deposit properly. The remaining 50 feet has carried sulphides of good quality, which I will refer to more fully when explaining the tabulated statement herewith appended of the various mill tests made.

In addition to the above work we have constructed a skip-way from the bottom of the slope to the crusher floor of the mill, a distance of 300 feet, installed a boiler, hoist, forge, Wilfley table, and made numerous changes to the milling plant in order to improve its efficiency.

The profitable concentration of this ore has presented some difficulties which, it is believed, have been overcome, and arrangements have been made for the installation of compressed air, and improved milling and concentrating plants, so that an average daily yield of over 50 tons may be maintained.

**COPPER.**—During the past season some additional work was done on the Coxheath property near Sydney. The details of the work are as follows;

The following statement of operations during the year ending September 30th, 1901, at Coxheath, Cape Breton, on areas held under copper leases 95, 106 and 250, is hereby respectfully forwarded for the information of the department:

Owing to the company having temporarily diverted its funds to the instalment of a steam saw mill on its timber lands at Watson's Creek, near the N. W. Arm of Sydney Harbor, mining operations on its copper leases have been confined during the past year to surface explorations and the sinking of pits; some of the older pits have been sunk to a depth of 20 to 35 feet, more definitely proving the dip and strike of the western extension of the Coxheath veins and the composition of the gangue rock.

From one pit on lease 95 (Coxheath) several hundred lbs. of the low grade ore was shipped to Denver, Colorado, for a concentration test on a Wilfley Table, with the following result:

Assay of ore before concentration, 3% copper.

Concentrates.—Copper, 9.90% ; iron, 27.30 % ; silica, 35% ; tailings, copper, 1%.

In actual practice, with improved slime saving apparatus, the loss in the tailings can be reduced to considerably less than 1%.

The pits sunk on the northerly vein on lease 106 (Argyle) continue to show more quartz in the Gangue rock than the lode on lease 95. Average samples of the ore from two of the pits have been assayed with the following returns :

Pit " A "—Copper, 2.15 p. c. ; gold, .036 oz. ; silver, 3 ozs.  
Copper, 3.26 p. c. ; gold, .075 oz. ; silver, .16 oz.

Pit " C "—Copper, 4.55 p. c. ; gold, .223 oz. ; silver, 6 ozs.  
Copper, 4.47 p. c. ; gold, .04 oz. ; silver, 16 oz.

The amount of labor performed during the year was as follows :

Skilled labor above ground,	-	-	361 days.
Unskilled labor above ground,	-	-	827 days.
Teaming labor,	-	-	114 days.
			<hr/>
Total days' labor,	-	-	1303 days.

Mr. W. N. Young continued working in the district between Mira and Gabarus, and is reported to be testing a numbr of properties which will, it is expected, be available for working.

A little work was done by the Copper Crown Mining Company, at intervals, during the summer.

At Cape D'or, Cumberland Co., the Colonial Copper Company have made extensive developments on zones in the trap rock carrying metallic copper. The quantity of available rock, and its percentage of contents are reported as encouraging.

The following memo. shows the work performed :

COLONIAL COPPER MINE.—This mine is situated at Horse Shoe Cove, Cape D'or, Cumberland County.

No. 1 shaft is sunk 330 feet 12 x 6 inches wide. It is intended for a double cage 4 feet 6 inches each, and 3 feet for manway. It is a splendid piece of work, timbered with deal 3 feet thick down to the bottom ; this shaft when down to the lode will be 350 feet.

One thousand feet south of No. 1 shaft No. 2 shaft is sunk 60 feet, and timbered 56 feet from top.

One mile from No. 1 shaft they are driving a slope down ; it is now sunk to the depth of 120 feet, at an angle of 45 degrees.

There is good steam power on No. 1 shaft, and steam machinery on the way for the others.

They have built snug cottages for their workmen and at an early date I believe the Colonial Copper Co. will be in a position to give a good account of themselves.

J. A. Hanaway is superintendant of those works.

At No. 1 shaft there are 2 drill men, 4 miners, 2 deckmen, 2 engineers.

At No. 2 (incline shaft), 2 drill men, 2 miners, 2 deckmen, 2 engineers.

In tunnel at No. 2 shaft—1 drill man, 2 miners.

At No. 3 shaft—4 miners, 2 deckmen, 2 engineers.

As to the laborers above ground during the summer and fall there are employed 60 to 75 men. During the winter months not more than 15 or 20. Most of the work so far has been development work.

GYPSUM.—The operations in the gypsum quarries do not call for any special reference.

MANGANESE.—Practically speaking no work was performed on the deposits of this mineral during the past year.

BARYTES.—The Messrs. Henderson and Potts continued mining at Cape Rouge, Inverness County, and extracted about 600 tons of high grade ore.



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## BORING MACHINES.

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### MEMORANDUM OF BORING OPERATIONS WITH THE GOVERNMENT DRILLS.

Within the past 18 months 5 drills of different patterns have been purchased by the Government, and have all been kept continuously employed since their arrival. They include the following patterns:—

*Two large size Calyx drills* with 1,000 feet guaranteed boring capacity, and full equipment, including a special apparatus for the preservation of coal cores, and all the parts necessary for producing a 5 inch or 6 inch core as desired. These drills are made by the Davis, Calyx Drill Co., of New York, and retain besides the cores a perfect record of the formation passed through in the chips and sludge in the "chip cup."

*One steam "Beauty" Diamond drill (class C)*, supplied by the Sullivan Manufacturing Co., of Chicago, which has a guaranteed capacity of 800 feet, and produces a core  $\frac{1}{8}$  of an inch in diameter.

*Two Diamond hand power drills* supplied by the same company, and capable of boring 300 feet. The cores produced by these are of the same diameter as the steam drill, and the parts of all three are interchangeable.

The first Calyx drill commenced boring in Oct., 1900, at a point on the Berteaux Farm, about three miles south of Wilmot Station, and on the road to Torbrook. Three holes were put down here, the deepest of which was 330 feet. Through unfortunate locations no vein was actually bored through, though excellent indications were shown by the cores. It should be mentioned that the rocks in this locality consist of hard slates and quartzite bands dipping at a steep angle to the south, and with a strike of N. 62° E.

The next position chosen was in F. Wheelock's farm, about 2 miles west of the first situation, and on the north side of the valley formed by the Torbrook or Black River. This hole proved eminently successful, and the surface having being carefully examined at first, three distinct veins were intersected, at the depths shown in the following section:—

MATERIAL.	Thickness of Strata.		Total depth from surface.	
	Ft.	In.	Ft.	In.
Surface detritus .....	14	....	14	....
Slates and quartzite.....	98	....	112	....
Brownish red hematite ore (Fossiliferous) .....	38	....	120	....
Slates .....	176	6	326	6
Brownish red hematite ore .....	38	6	365	....
Slates with small seams of ore .....	75	....	440	....
Brownish red hematite ore .....	36	....	476	....
Slate and bands of quartzite .....	144	....	620	....

The dip of the rock in the above hole changed from 84° at surface to 70° to the south, so it will be seen that the veins cut showed a good thickness. The drill was then moved across the valley to the McConnell farm, about 1 mile south, and two veins on the north dip were cut there, as shown below :—

The strata flattened here from 87° at the surface to 83° at the bottom of the hole.

MATERIAL.	Thickness of Strata.		Total depth from surface.	
	Ft.	In.	Ft.	In.
Surface material.....	5	....	5	....
Slates showing indications of ore .....	57	...	62	....
Magnetic ore .....	30	....	92	....
Slates with patches of ore.....	38	....	130	....
Magnetic ore .....	29	....	159	....
Slates containing small seams of ore .....	33	....	192	....

In the hard rocks of this section, and under severe conditions, an average rate of boring was attained of nearly 1 foot per hour at a cost of about \$2.00 per foot, while in the softer portions of the slates from 4 feet to 6 feet per hour was done easily.

The drill was removed during the summer of 1901 to Upper Kennetcook, where boring was commenced on Aug. 16. Though this formation has been referred by the geological survey to the Lower Carboniferous, and in parts to the Millstone Grit, surface explorations showed fair indications of coal though the quality and thickness appeared to be inferior. The rock dips at about 30° southeasterly. The first hole was started at a point between the line of the Midland Railway and the Kennetcook River, and about 40 feet from supposed

line of outcrop of the seam. The total depth reached in this hole was 132 feet, shales and sandstones constituting the cores, while at about 62 feet from surface 49 inches of a slaty coal was gone through. Unfortunately, in encountering this the coal cone lifter was not put on, and thus no core was retained. The next hole was at a point 300 feet from outcrop, and when down 250 feet it was found that it was necessary to line the hole with casing pipe in order to save it.

As this casing pipe is an expensive article it was decided to improvise a cheaper product made of sheet steel. After 200 feet of this had been put down the rivets cut, and the hole had to be abandoned. The records showed the material passed through to consist chiefly of sandstones and shales, with a few thin beds of gravel and blue clay. These beds are highly fossiliferous, the specimens obtained including calamite, cordaite, lepidodendra, sigillaria, etc.

The other Calyx drill was received by the department during the past summer and was sent to Hantsport, where at the present time a depth of 225 feet of boring has been attained. The rock here consists of sandstones and shales, and dips south east at a very flat angle.

*Steam Diamond Drill.*—This drill was first used in strata, referred by the Geological Survey to the "Millstone Grit," near North Sydney and several holes were bored at Pottles Lake, Ferris Lake and Little Bras D'r, nothing of value being discovered.

Though this drill is only guaranteed to bore 800 feet over 900 feet was done in one of the holes. Sandstones conglomerate, and an occasional bands of slate was passed through. The drill was next taken to the \*Drummond Colliery, where it is now being operated on the 1300 foot level.

One of the hand drills was used a short time at Whyecomagh in the iron, but operations were suspended before much was accomplished. It was then taken to Cape Breton, where it is now operating near Ligan to prove known seams to the deep.

The other hand drill was two months operating in the Musquodoboit Valley, and though over 300 feet of carboniferous measures were explored, nothing of value was found. The procedure in obtaining the drills is as follows: The applicant with two sureties give a bond for the value of drill and equipment in which the following agreement appears:

*Whereas*, The above bounden . . . . . has obtained from the said Commissioner of Public Works and Mines, the use of a

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\*Since writing a seam of coal upwards of 9 feet has been intersected at about 300 feet.

drill, the property of the Government of Nova Scotia, for the purpose of boring for mineral upon certain conditions, to wit :

that the said ..... shall pay all expenses of transport from place of storage to site of bore hole, of setting up, running, operating and maintaining the same in working order, including cost of all piping, rods, diamonds and other material found necessary, also all wages, fuel and damage, including wages of man placed in charge of drill equipment by the said the Honorable Commissioner of Public Works and Mines, and all charges of removing drill equipment from bore hole to bore hole, and of returning the same to such place as may be appointed by the said Honorable Commissioner of Works and Mines, and shall also keep a correct record of all strata bored through, and place the same at the disposal of the said Honorable Commissioner or his agents, and shall deliver over the drill equipment in good order to any person or persons appointed by said Honorable Commissioner to receive the same.

That the government were particularly fortunate in their selection of the drills is evident from the fact that though upwards of 5000 feet of boring has been accomplished not a hole was lost or had to be abandoned on account of any inefficiency in the machines.

D'ARCY WEATHERBE, C. E.,  
*Mines Department.*

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## ARBITRATION.

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In the matter of the Miners' Arbitration Act, and in the matter of disputes in respect to wages, between the Dominion Coal Company and its employees, numbers one and three divisions at Reserve, Dominion No. 1, Glace Bay; numbers 3 and 4 and Bridgeport Mines.

### BOARD OF ARBITRATORS:

The Honourable Mr. Justice Graham.  
The Honourable Robert Drummond.  
The Venerable the Archdeacon of Cape Breton.  
Henry S. Poole Esq., M. A. F. G. S.  
Angus G. Macdonald, Esquire.

*Whereas*, disputes in respect to wages have arisen between the Dominion Coal Company and its employees, numbers one and three divisions (as classified under the said Act), at the said mines; the employees of the said division, number one demanding an increase of 12 per cent on their wages, and the employees of division number three, demanding an increase in wages of 50 cents per day for mechanics, and of 25 cents per day for their help, to come into force on the first of January, 1901; and the Company not complying with the said demand;

*And whereas*, Under the said Act, the said disputes were by an order of the Honorable, the Commissioner of Public Works of Mines, on the 4th day of March, 1901, referred under the said Act to a Board of Arbitrators.

*And whereas*, The arbitrators have been duly appointed under the said Act to comprise the said Board, that is to say, the first two named have been appointed by the Governor-in-Council, the third and fourth named have been respectively appointed by the agents of the said divisions and of the said Company, and the last named has been appointed by the two arbitrators appointed by such agents, and with the consent of such agents, and such arbitrators have been sworn according to the said Act.

Now having duly entered upon the said reference and considered the cases respectively presented by the said agents on behalf of the said divisions and the said Company respectively, and after hearing the evidence adduced by them respectively and the arguments, and having deliberated, we hereby make this our award in respect to the premises.



1. We decide and award that neither of the said divisions is entitled to the increase demanded by it in whole, or in part.

2. In respect to the demand of number one division, the following reasons for our decision are submitted :

In or about the month of May, 1900, the Company in anticipation of an advance in the price of coal granted to the miners an increase.

While published prices and local rates showed a considerable advance in the prices of coal as compared with those of previous years naturally leading the employees to assume that the Company was in receipt of a corresponding increase ; the evidence showed that this assumption was erroneous. While prices advanced in the local market, the existence of long term contracts previously entered into by the Company at low rates, and covering by far the greater part of the Company's sales had the effect of nullifying to a large extent this advance. In addition, the net rate per ton received by the Company was further reduced by the increased cost of materials and production to such a degree that the net average price per ton realized by the Company from the sales of coal for the financial year ending February, 1901, was not one half cent per ton in excess of that of the preceding financial year.

The Board has not dealt with the prospective trade of the current financial year, but if it should result at its close in the Company realizing increased prices over those of the financial year ending February, 1901 warranting an advance in wages, the miners should, in the opinion of the board, participate in such profits on a basis to be agreed upon or otherwise determined.

3. In respect to the demand of the mechanics and their help, it appears that after the demand was made, that is to say, on or about January, 1901, an increase of wages was granted by the Company. We are of opinion that as compared with other similar wage earners they are now receiving a fair rate of wages.

There may be exceptional individual cases which require readjustment, but with such cases the board cannot satisfactorily deal, and recommends them to the further consideration of the management.

Dated at Truro, N. S., this twenty-fifth day of April, A. D. 1901.

WALLACE GRAHAM.

R. DRUMMOND.

DAVID SMITH, Archdeacon N. S.

HENRY S. POOLE.

A. G. MACDONALD.

Witness

W. H. Huggins.

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HALIFAX, June 29th, 1901.

TO THE HONORABLE C. E. CHURCH,

*Commissioner of Public Works and Mines.*

SIR,—As chairman of the board of arbitrators, selected to determine the disputes in respect to wages between the Dominion Coal Company and certain of its employees, I have the honor to report, pursuant to R. S. 1900, C. 21, S. 18, the operations of the board under the order of reference made by you on the 4th day of March, 1901.

The members of the board, with the exception of the Venerable the Archdeacon of Cape Breton, met, pursuant to notice of the chairman at Halifax, in the Legislative Council chamber, on the 9th of April, 1901, and were sworn in. Mr. W. B. Ross, K. C., appeared for the company and Mr. John Moffatt for the employees. Mr. W. H. Huggins was appointed secretary. The course of procedure was discussed, and it was determined that each party should present in writing a statement of their case.

On the 10th the board met again, when the Archdeacon of Cape Breton, being present, was sworn in, and the case of the Employees was presented.

On the 11th the case of the company was presented. Both cases were then read and the examination of witnesses for the employees was commenced and lasted throughout the day.

On the 12th the examination of witnesses was continued and the board adjourned to meet on the 18th at Glace Bay in Cape Breton.

On the 18th and 19th, at Glace Bay, the examination of witnesses was continued, and after a meeting for discussion at Sydney, the board adjourned to meet at Truro on the 25th. The Board met at Truro on that date, then further evidence was taken and an award made.

In all, there were three witnesses on behalf of the employees and eleven on behalf of the company.

The evidence of the witnesses was taken stenographically by the secretary of the board. I have the honor to enclose a copy of the evidence. I, of course, except such portion of it as would "divulge matters of the employers' business." These matters, under section 12 of chapter 21, the arbitrators are sworn not to divulge.

The secretary, under section 11, has filed with the Prothonotary of the Supreme Court for the County of Cape Breton a copy of the complaint lodged in your department, and also a copy of the award.

The fees of the arbitrators and their travelling expenses with those of the secretary have been defrayed by your department. I believe that this became necessary owing to the waiver of the provision requiring the employees to submit to a very large deduction from their wages in order to constitute a deposit for forfeiture in case of an adverse award and to defray expenses. The amendment of this provision was very necessary in the interest of employees and will, I think, tend to make arbitration a more successful mode of dealing with such disputes.

Perhaps the interests of the province have been subserved to such an extent by the successful settlement of the disputes in this case, by an unanimous award, that the payment of these expenses will be considered a minor matter.

It may not be out of place to refer to matters in this Act which would be the better of an amendment, although, owing to the very conciliatory and sensible conduct of the agents of the parties, and I may add of my colleagues on the board, no technical difficulties were raised.

The powers of the arbitrators or rather the expression "dispute" as to wages, required further definition.

The first meeting of the board ought to be summoned by the Commissioner of Public Works and Mines or by the chairman of the Board, if the government is given power to appoint the chairman.

Provision should be made for the oath not to divulge the company's business being taken by others than the arbitrators. For instance, the employees' agent and their solicitor, if they have any, are necessarily present when the evidence is taken.

In conclusion I wish to express on behalf of the board my obligations to Dr. Gilpin, the efficient deputy of your department, for invariable courtesy and pains, bringing its labors to a successful issue, and also to the agents of both parties for their extreme fairness and frankness in conducting the case.

I have the honor to be

Your obedient servant,

WALLACE GRAHAM.

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## PROVINCIAL MUSEUM AND SCIENCE LIBRARY.

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PROVINCIAL MUSEUM,

Halifax, 22nd January, 1902.

To E. GILPIN, Jr., Esq., LL. D., etc.,

*Deputy Commissioner of Public Works and Mines :—*

SIR,—I respectfully present herein a report on the Provincial Museum of Nova Scotia and the Provincial Science Library, for the past year.

During the year a great increase took place in the number of specimens received. In the previous year, 133 accessions were catalogued, representing 1202 specimens; whereas during 1901 there were 545 accessions, embracing 2660 specimens.\* These specimens almost entirely related to the province, and filled many blanks hitherto existing in the collections.

In the last report it was stated that the mineralogical specimens would be finally arranged on the return of the large and important exhibit of Nova Scotian minerals that had been sent to the Paris and Glasgow exhibitions. On the close of the latter exhibition, however, the collection, with the exception of the gold exhibit, was presented to the Imperial Institute of London, and it will now devolve upon us to collect for our own Museum a series that will fill the great blank caused by the non-return of this large collection. It will therefore probably take some time to bring the Nova Scotian mineral collection into a satisfactory condition.

A large part of the time has been taken up in determining and labelling old specimens throughout the Museum. The marine invertebrates have been examined and labelled within and without the jars, and rearranged. This collection was found to contain a number of very interesting and uncommon species.

The collection of woods presented by Mr. Starr has been fully labelled in the manner referred to in the last report, and has a good appearance. A special glazed case for the collection is being constructed.

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\*1397 of these specimens are contained in the Lindsay Herbarium.



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Mr. A. H. C. Prichard, late of the Boston Museum of Fine Arts, who in 1900 very kindly prepared and presented to the Provincial Museum an exceedingly excellent manuscript descriptive catalogue of our ancient coins, during the past summer spent several months in a study of the modern coins, and has presented us with a similarly detailed descriptive catalogue of them in manuscript. He also published a series of interesting articles in the local press, based upon the ancient Roman coins in our cases. These articles greatly increased the public's interest in this department, and this interest in some cases has taken the form of donations. Mr. Charles Archibald of Halifax has presented a large series of coins which fills a number of blanks in the cabinet.

Since the last report a specially prepared "accession book" has been opened, the form of which is the result of considerable correspondence with other museums, and the accession entries are now all transcribed therein, a work that has taken some time.

It may be mentioned that all labels and record entries are written or hand-printed with waterproof India-ink, so that the fading of a label or entry is now impossible. Labels are mostly attached by strong linen thread to the specimens to prevent loss or misplacement. The permanent numbers, however, painted on the specimens, make the loss of data impossible, even if the label should be lost.

In August I spent a few days collecting in the Horton series of rocks at Horton Bluff and in the vicinity of Hantsport, and in September collected in the Millstone Grit, Coal Measures, New Glasgow Conglomerate, and Permian or Permo-Carboniferous of Pictou County, so that we now have a series of specimens representing the coal measures and the formations that over- and under-lie them. This should prove of service to the many who are seeking information regarding the the rocks, etc., that accompany coal. A number of miscellaneous local specimens were donated by persons met during these trips. As much time as possible has been spent in field work in the vicinity of Halifax.

To further assist in the study of lithology, a typical series of rock specimens and constituent minerals of rocks, numbering 150, was obtained from Frazar, of West Medford.

Efforts are being made to obtain specimens of rocks illustrating in general the geological formations of the Province, and to draw attention to those rocks that are of economic importance.

Prof. E. Haycock, of Acadia College, has presented a series of rock specimens illustrating the geological history of the Gasperreau Valley, a subject upon which he is publishing a paper.



Mr. R. H. Brown, late manager of the Sydney Mines, has donated a number of very fine fossils from the "main seam" of coal at the old Sydney Mines, the result of a number of years' collecting with special facilities. We are also indebted to Mr. F. H. Mason, Dr. A. J. Cowie, Mr. Weatherbe of the Mines Department, Prof. Kennedy of King's College, and others, for specimens of minerals and fossils. The Nova Scotia Steel and Coal Co., through Mr. Kitto, has given a set of their ores, etc.

Recognizing the gradual disappearance of old customs among the Micmac Indians, we are securing such implements, etc., as illustrate their habits during historic times. Among these articles is a small bark canoe of typical tribal form, fully equipped with every appliance. The Micmac names for the articles obtained, are noted whenever possible.

Dr. A. H. C. Lindsay, of Halifax, has donated a large herbarium of Nova Scotian plants, with cabinet.\* This is a very valuable addition. It was one of the collections from which Dr. Lindsay compiled his catalogue, of the Flora of Nova Scotia. It may be mentioned that Dr. How's collection, which also formed part of the material from which that catalogue was prepared, is also in the Museum. Dr. Lindsay's specimens will be mounted as soon as possible.

A small dredge for boat use has been obtained and will be operated next summer, and doubtless will add many specimens of marine invertebrates to the Museum. A collection of Nova Scotian mollusca is a desideratum at present and exertions must be made to secure one.

The collection of native birds is rapidly nearing a state of fair completeness. In the work of collecting for this department I have been assisted by Mr. R. W. Tufts, of Wolfville, Mr. E. C. Allen, of Acadia, Yarmouth Co., and others. Mr. Watson L. Bishop, of Dartmouth, has presented a collection of ninety-one birds' eggs with the fullest scientific data.

A series of regularly recorded observations on bird migration has been inaugurated with observers in various parts of the province, and a mass of interesting material will ere long be at hand for those studying our avian fauna.

A large collection of Nova Scotian Lepidoptera has been promised, and a special case, with drawers, is being constructed for its reception. This collection will be arranged according to the "block system" of Prof. Comstock, which is doubtless the most convenient for a growing collection. Mr. J. Perrin, of McNab's Island, and Miss L. C. Eaton, of Truro, has already donated a number of insects, and they and others have promised further to assist as soon as an insect cabinet is ready.

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\*It contains about 1397 specimens.

A case has been built to receive a collection of delft-ware and porcelain, brought into Nova Scotia and New Brunswick by early settlers and Loyalist families, and collected by the late Mrs. Weldon, of Halifax.

Specimens representing the industries of the Province have continued to be secured. These embrace among others, leather, paper, pulp, pegs, tweeds, yarns, mineral waters. etc. A collection of Nova Scotian apples has also been obtained, prepared by the School of Horticulture. As the season was late when these were prepared, some of the specimens were over-ripe, and will require to be replaced by new ones next autumn.

A chart giving a synopsis of the climate of Halifax, based on official observations of from ten to thirty-two years, has been specially prepared for the Museum by the Meteorological Department of the Dominion, and will be annually corrected.

In the work of obtaining specimens, I have been assisted by a number of voluntary collectors throughout the Province, who are very kindly on the alert to secure for us specimens that we require.

A full list of donors is appended. Owing to the great increase in the number of accessions, the names of the specimens given by each are omitted.

As before, a large number of minerals and other specimens has been identified for those who have brought them to the Museum for that purpose. The Museum is becoming a bureau for inquiries regarding the resources of the province in general, and a good deal of time is taken up in answering inquiries on this subject.

The zoological and geological classes of Dalhousie College, under Dr. A. H. MacKay and Mr. H. S. Poole, have visited the Museum to view specimens connected with their studies, and it has been officially visited by the Mining Society of Nova Scotia. The Halifax Botanical Club, as mentioned in the annexed library report, has met fortnightly for study in the reading-room.

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#### DONORS.

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Abbot (E. M.); Aeadia Colliery, Westville; Allen, (E. C.), Argyle, N. S. Annand (Frederick W.); Arbuckles (A. A.), New Glasgow; Archibald (Charles); Archibald (Mrs. Charles); Armitage (Rev. W. J.)

Bell (F.); Bigelow & Hood; Bishop (Watson L.), Dartmouth; Blackwell (H.), London, G. B.; Brookfield Bros.; Brown (R. H.); Burgess (Dr. Frederick N.), Cheverie.

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Cavanagh (J. H.), New Glasgow; Cope (Joseph); Cowie (Dr. A. J.); Creighton (Jermain).

Dimock (C. Henry), Windsor; Dunbar (John H.), Stellarton; Dunn (Wm. R.)

Eaton (Miss Lucy C.), Truro; Eagar (R. F.), Dartmouth.

Farquhar (Capt. Jas. A.); Ferguson (Wm. A., M. P. P.), Guysboro; Fraser (Capt. A.)

Gilpin (Alfred E.); Gilpin (Dr. E., Jr.); Gragg (Isaac P.), of C. B. Copper Co.

Haycock (Prof. Ernest), Wolfville; Heffler (Clifford E.); Herbin (F.), Wolfville; Hill, (T. Vardy).

Kennedy (Prof. G. T.), Windsor; Kitto (Victor), Ferrona; Kline (John).

Lewis & Sons (J.), Lewiston; Lindsay (Dr. A. W. H.)

Macdonald (Simon D.); McFarlane (J. F.), Ferrona; MacKay (Dr. A. H.); MacKenzie (Jas. W.); McLeod (R. R.), Brookfield; Mason (F. H.); Meteorological Office, Toronto; Michener (R.), Hantsport; Mines Department of N. S.; Morash (Charles), Cole Harbour.

Nisbet (Wm. C.); Nova Scotian Institute of Science; Nova Scotia School of Horticulture, Wolfville; Nova Scotia Steel & Coal Co., Ferrona.

Oxford Manufacturing Co., Oxford.

Parker (W. A.), Shubenacadie; Patrick (Rev. Bro. A.); Pentz (F.), Hantsport; Perrin (J.), McNab's Island; Piers (Charles); Poole (Henry S.); Prest (Walter H.), Bedford; Prichard (Arthur Henry C.), Boston.

Reid (Frank H.), Middleton.

St. Croix Paper Co., Ltd.; Scott (Leonard), Gore; Sears (Prof. F. C.), Wolfville; Silver (Harold S.); Smith Bros.; Smith (Cyril E.); Smith (Walter); Sweet (Edward F.), Hantsport.

Taylor & Co. (R.); Tufts (Harold F.), Wolfville; Tufts (Robie W.), Wolfville.

Waddell (W. H.); Weatherbe (D'Arcy); Wilber & Son (N. B.), Elmsdale; Wilson & Son (A.); Wiltshire (Frank), Bedford; Windsor Plaster Co., Windsor; Woolaver (Miss L. R.); Working Men's Syndicate, New Glasgow.

## Provincial Science Library.

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Since my last report, the library of the Mining Society of Nova Scotia, consisting of mining and metallurgical periodicals, &c., has been removed to the Science Library and shelved. It consists of 176 volumes, bound, and about 177 pamphlets.

The mass of unsorted periodicals from the Institute of Science, which had accumulated at the librarian's office, and which was received after the main portion of the library had been shelved, has been sorted and shelved.

Publications—weekly, monthly or yearly—are now received from about 475 institutions devoted to pure science, agriculture, mining, civil, mechanical and electrical engineering, and commercial geography. During the year 26 new societies have been added to our list of donors for the future. Accurate figures as to the number of bound and unbound volumes in the library are not at hand, although a count will probably be made during the coming year. In 1899 the Institute of Science's Library alone was estimated to contain about 3,000 bound and unbound volumes, and the growth has been very rapid since then. About 900 volumes and 62 pamphlets were received from the Legislative Library, and 176 volumes and 177 pamphlets from the Mining Society, as before mentioned.

During the year a number of recently-published manuals and other works were purchased with funds supplied by the Government. These were carefully selected and should be of much use. The Mines Department and Dr. Gilpin have also furnished a number of books of recent date. The necessity for other comprehensive works of late date, is very great, and it is in this department the library most needs strengthening, as the works from the Legislative Library are mostly too old to be of much service in these days of rapid scientific advancement and improved methods. A number of mining works will probably be added during the coming year.

No binding has been done since the transfer of the library from the Institute of Science. Many volumes are complete and ready for the binder and should be bound during the coming year.

New accession books are about being prepared, as the very large number of publications received of late years by the Institute of Science has caused the pages of the old ones to be in many cases overcrowded. In reopening these books, much advantageous rearrangement will be made, as suggested by experience in the past.

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A loan book has been opened for the registration of books borrowed.

Tables and chairs have been placed in the reading-room since the last report, and the floor has been covered with oil-cloth.

As anticipated, the Library is being largely used by mining men, engineers, students and the general public.

The reading-room has been used twice a month by the Halifax Botanical Club, which has met there for the purpose of studying the plant life of the province.

The Library has been of very great use in connection with the work in the Museum, as an assistance in the study of the specimens and as a reference from the labels.

I have the honor to be, Sir,

Your most obedient servant,

HARRY PIERS,  
*Curator and Librarian.*

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I remain, Sir.

Your obedient servant,

E. GILPIN,  
*Deputy Commissioner and Inspector of Mines.*





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TABLES.

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## LIST OF MINERAL LEASES (OTHER THAN GOLD.)

## IRON.

No. of LEASE.	NAME OF OWNER.	COUNTY	AGENT OR OWNER.	ADDRESS.
232 .....	Brookman, P .....	Cape Breton .....	.....	.....
102 .....	Smith, W .....	" .....	.....	.....
103 .....	McKenzie, H. R. ....	" .....	.....	.....
104 .....	McKenzie, J. W .....	" .....	.....	.....
258, 259, 260, 261 .....	McPherson, M. A .....	" .....	.....	.....
238 .....	Matheson, A .....	" .....	.....	.....
43, 44, 47, 48, 49, 50, 51, 52, 53, 54, .....				
55, 56, 57, 58, 59, 87 .....	Bartlett, J. H .....	Pictou .....	.....	.....
68, 71, 83 .....	Nova Scotia Steel & Coal Co. ....	" .....	.....	.....
67 .....	Cameron, Nathan .....	" .....	.....	.....
61 .....	Cameron, J. A .....	" .....	.....	.....
82 .....	McMillan, J. R .....	" .....	.....	.....
10 .....	Fraser, W. J .....	Inverness .....	.....	.....
57 .....	Cape Breton Iron Co. ....	" .....	.....	.....
22 .....	McMillan, J. R .....	" .....	.....	.....
89 .....	McKenzie, J. A .....	" .....	.....	.....
99 .....	Fraser, W. A .....	" .....	.....	.....
5 .....	McDougald, J .....	Antigonish .....	.....	.....
7 .....	McDonald, L .....	" .....	.....	.....
8, 9, 10, 11 .....	Cowlan, G. B .....	" .....	.....	.....

14	Wilkie, C. W.	"	"	"
1, 2	Nova Scotia Steel Co	Guysboro	"	"
1	McIntosh, J. C	Hants	"	"
12	Matheson, J	Richmond	"	"
2	Miller, J. C	Halifax	"	"
COPPER, LEAD, ETC.				
126	Matheson, A	Cape Breton	"	"
95, 106	Cape Breton Copper Co	"	"	"
105, 181	Burchell, J. E.	"	"	"
94	McKenzie, D.	"	"	"
244	Granger, B	"	"	"
116	Greener, J.	"	"	"
228	Young, W. N.	"	"	"
277	McInnes, H.	"	"	"
6	McLennan, J. S	Victoria	"	"
5	Colonial Copper Co	Colchester	"	"
132, 133	Copper Crown Mg. Co.	Cumberland	"	"
136	Wallace River Copper Co.	"	"	"
56	Harrison, H	Inverness	"	"
58, 59, 62, 102, 103	Inv. Mg. Co	"	"	"
55	Cheticamp Gold Mg. Co	"	"	"
5	Fraser, J. H	Antigonish	"	"
6	Brown, R. C	"	"	"
12	McDonald —	"	"	"
13	McDonald, A. K.	"	"	"
88	Holmes, S. H	"	"	"
2	Churchill G. W	Hants	"	"

LIST OF MINERAL LEASES (OTHER THAN GOLD.)—(Continued.)  
COPPER, LEAD, ETC.

No. of LEASE.	NAME OF OWNER.	COUNTY.	AGENT OR OWNER.	ADDRESS.
4	Cameron, J. J.	Guy'sboro'		
	COAL.			
83, 84, 85.	Barton, A. McG.	Pietou.		
3/1, $\frac{1}{2}$ , $\frac{2}{3}$ , 3, 4, 69.	Acadia Coal Co.	"		
5, 12, $\frac{1}{3}$ , $\frac{1}{4}$ , 66, 90, 91, 92, 93.	Intercolonial Co.	"		
46, 8/6, 68, 70.	Nova Scotia Steel & Coal Co.	"		
86.	Murray, S.	"		
10/24.	Richey, M. H.	"		
11/11, 45, 9/10.	Gray, B. G.	"		
56, 22/51, 74, 95, 96, 97, 98, 99, 100,				
101, 102, 103, 104.	Canada Coals & R'y. Co.	Cumberland.		
19/44, 55, $\frac{1}{6}$ , $\frac{1}{7}$ , $\frac{1}{8}$ , $\frac{2}{9}$ , $\frac{2}{10}$ , 61, 62, 70, 71,				
70, 71, 72, 73, 75, 76, 77, 78, 79, 81,				
82, 83, 84, 85, 87, 88, 90, 108, 109,				
110, 111, 112, 113, 114, 115, 116,				
117, 141, 118, 119, 120, 121, 122,				
123, 124, 89, 93, 60, 66, 67, 68, 69,				
125a, 126, 128, 129, 135.				
8/5.	Lawson Coal Rail'y. Co.	"		
	Cumberland Rail'y. Coal Co.	"	J. R. Cowans.	Springhill.



6/12	Robertson, Hugh	Cumberland	
15	Prospect Mining Co.	"	
9/22, $\frac{10}{23}, \frac{11}{28}, \frac{12}{29}, \frac{13}{30}$	Styles Mining Co.	"	
22/53	Binney, J. W.	"	
57	Salt Springs Coal Co.	"	
26/16	Minudie M. & T. C.	"	
60, 61	Tupper, C. H.	"	
105	Leckie, R. G.	"	
94, 65	Faulkner, G. E.	"	
80	Gue, T. R.	"	
86	Rutherford, J.	"	
91	Fraser, H. R.	"	
131	Hickman, J. S.	"	
34, 107, 134	Weatherbe, U. J.	"	
106	Vroom, W. E.	"	
125	Franklyn, Geo. E.	"	
14	Joggins C. M. Association	"	
24/47, 25/9	Boston Coal Mg. Co.	"	
94	Ripley, E.	"	
$\frac{43}{43}$	Moore, R. G. M.		
13/79, 1/27, 2, 3, 28, 29, 30	Nova Scotia Steel & Coal Co.	Cape Breton	
173, 58/67	Weatherbe, R. L.	"	
111, 164	Sydney Coal Co.		
45/5, 46/28, 47/29, 50/40, 51/41, 52/42, 60/54, 61/55, 62/56, 63/57, 64/58, 65/59, 66/60, 67/61, 68/62, 69/63, 108, 109, 110, 188, 207, 140, 252, 253, 254, 255, 256, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 278, 279	Dominion Coal Co.	Cape Breton	H. Donkin
			Glace Bay

LIST OF MINERAL LEASES (OTHER THAN GOLD.)—(Continued.)  
 COAL—(Continued)

No. of Lease.	Name of Owner.	County.	Agent or Manager.	Address.
117, 246	Hamilton, A. G.	Cape Breton		
142	LeCras, Henry			
220, 214	Cayley, H. St. Q.			
179, 180, 168, 190, 208, 223, 241	Roberts, F.			
130	Mitchell, A. B.			
212, 131, 128, 129, 134, 135, 136, 139, 144, 182, 200, 219	Moseley, E. T.	"		
138, 149, 184, 224	White, A. J.	"		
141, 177, 244, 213, 112, 113, 114, 115, 116	Cumberland Ry. & Coal Co.	"		
235, 146, 193, 194, 216	Gowrie & Block House Collieries	"		
166	Dunn, J.	"		
242	Can. Oil & Coal Co.	"		
247	McNeil, H. F.	"		
161	Routledge, T.	"		
282	Moseley, E. W.	"		
169, 170, 183	McVey, Jas.	"		
178	Routledge, E.	"		
165	Stephens, L. H.	"		
163, 185	Hamilton, C. F.	"		
199	Copeland, J. D.	"		

243, 171, 174	Gorham, J. W.	"	.....	.....
211, 233, 236	Burchell, J. E.	"	.....	.....
215	McKinnon, D. L.	"	.....	.....
234	Ross, H.	"	.....	.....
186, 187, 202, 205, 206, 209	Kennelly, D. J.	"	.....	.....
210	Harold, T. C.	"	.....	.....
196, 237, 222	Routledge, T.	"	.....	.....
201, 221	Hickey, C.	"	.....	.....
192	McKenzie, J. A.	"	.....	.....
175	McDonald, J. W.	"	.....	.....
225	Cossett, G. G.	"	.....	.....
167	Murray, J.	"	.....	.....
191, 197	McVicar, J.	"	.....	.....
229	Matheson, D.	"	.....	.....
218	Morrison, D.	"	.....	.....
217	Townshend, James.	"	.....	.....
248	McMillan, J.	"	.....	.....
275, 276	Petrie, L. A.	"	.....	.....
258, 259, 260, 261	McPherson, M. A.	"	.....	.....
1/13, 6/4, 7/10, 26, 29, 30, 111, 112, 113	Port Hood Coal Co.	"	.....	.....
251	Caldwell, T.	"	.....	.....
226	Stephen, A.	"	.....	.....
227	Johnson, J. A.	"	.....	.....
231	Owen, J. M.	"	.....	.....
7	Dominion Coal Coal Co.	Victoria	.....	.....
1/2	Burchell Bros.	"	.....	J. T. Burchell N. Campbellton
8, 9	Fraser, J. W.	Inverness	.....	.....
11	Dawson, G.	"	.....	.....

## LIST OF MINERAL LEASES (OTHER THAN GOLD.)—Continued.

## COAL.—Continued.

No. OF LEASE.	NAME OF OWNER.	COUNTY.	AGENT OR OWNER.	ADDRESS.
13, 14, 15, 18, 19, 20, 23, 24, 25, 28, 40, 41, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 100, 101, 104, 105...	{ Inverness & Richmond Coll. and Rail'y. Co. Ltd.	Inverness . . .	. . . . .	. . . . .
3/11, 27 . . . . .	McKenzie & Mann. . . . .			
29, 30 . . . . .	Tremaine, E. D. . . . .			
35, 38, 39 . . . . .	Ross, W. . . . .			
43, 44 . . . . .	Farquhar, J. A. . . . .			
31 . . . . .	Sutherland, W. A. . . . .			
32, 33, 84, 42 . . . . .	Wallace, T. A. . . . .			
63, 64, 65, 96, 97, 98 . . . . .	Taylor, Ira. . . . .			
66, 108, 109 . . . . .	Lithgow J. R. . . . .			
67, 68 . . . . .	McDonald, W. B. . . . .			
69 . . . . .	McInnes, H. . . . .			
70, 71, 72, 77, 78, 79, 80 . . . . .	Roche, Wm. . . . .			
73, 74, 75, 76 . . . . .	Townshend, S. . . . .			
81, 110 . . . . .	Caldwell, T. . . . .			
82, 83, 84, 85, 86, 87, 88 . . . . .	Andrews, J. W. . . . .			
89, 90, 91, 92, 93, 94, 95 . . . . .	Sherman, C. E. . . . .			
106, 107, 114, 115, 116, 117, 118, 119, 120, 121 . . . . .	Mabou Coal Mfg. Co. . . . .			

1	7, 8	Terminal City Co.	Richmond	
2		Columbia Coal Co.	"	
3		Reynolds, W. K.	"	
5		Chisholm, W.	"	
4, 6, 9		Lennoxville T. & C. Co.	"	
11		Eastern Dev. Co.	"	
13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23,		H. Pearl	"	
24, 25, 26, 27, 28, 29, 30, 31, 32, 33.				



## COAL—SALES.

NAMES.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Year 1901.	Year 1900.
NOVA SCOTIA:						
Land Sales ...	99,843	210,212	96,479	78,606	485,140	379,205
Sea Borne....	96,974	29,020	151,698	235,982	513,674	484,695
Total N. S....	196,817	239,232	248,177	314,588	998,814	863,900
New Brunswick.	109,136	92,713	88,252	59,893	349,994	406,519
Newfoundland ..	28,018	24,496	22,680	30,426	105,620	99,307
P. E. Island.....	1,279	.....	20,423	32,071	53,773	68,103
Quebec.....	32,770	109,022	415,998	459,256	1,017,046	934,229
West Indies .....	.....	.....	.....	.....	.....	.....
United States...	188,619	138,959	129,326	133,183	590,086	624,273
Other Countries.	.....	.....	.....	4,002	4,002	1,215
Total .....	556,638	604,422	924,856	1,033,419	3,119,335	2,997,546

## COAL—GENERAL STATEMENT.

1901.	Production.	Colliery Consump- tion.	Sales.
1st Quarter.....	764,971	56,149	556,638
2nd " .....	810,993	77,745	604,422
3rd " .....	1,040,230	76,528	924,856
4th " .....	1,009,171	66,234	1,033,419
Total.....	3,625,365	278,207	3,119,335

## COAL PRODUCE OF NOVA SCOTIA FOR YEAR ENDED SEPTEMBER 30, 1901.

COLLIERY.	Produce.	Sales.	COLLIERY CONSUMPTION.	
			Engines.	Workmen.
Joggins .....	66,065	53,352	8,401	1,646
Jubilee .....	500	463	30	7
Scotia .....	1,221	1,052	.....	50
Springhill .....	410,440	359,603	31,125	14,871
Acadia .....	271,145	229,431	32,305	5,888
Intercolonial .....	219,023	191,482	15,037	3,570
Dominion .....	2,352,567	2,055,599	107,460	27,250
N. S. S. & C. Co. ....	238,646	184,303	14,188	8,202
Gowrie & B. House .....	16,681	12,310	2,372	808
Sydney Coal Co. ....	11,040	8,743	172	155
New Campbellton .....	14,771	11,309	1,702	960
Broad Cove .....	56	.....	28	.....
Mabou .....	1,028	852	5	10
Pt. Hood .....	22,182	10,836	1,517	448
	3,625,365	3,119,335	214,342	63,865

\*Pietou Co.

TABLE A.—COAL TRADE BY COUNTIES FOR THE YEAR ENDED SEPTEMBER 30TH, 1901.

	CUMBERLAND.		PICTOU.		CAPE BRETON.		OTHER COUNTIES.		TOTAL.	
	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.
1st Quarter . . . . .	132838	120939	133317	110842	492993	320217	5823	4640	764971	556638
2nd " . . . . .	126420	107020	119438	93836	564267	403283	868	283	810993	604422
3rd " . . . . .	127283	106450	132102	118627	762674	695036	18171	4743	1040230	924856
4th " . . . . .	91685	80031	105311	97608	799000	842419	13175	13331	1009171	1033419
Total . . . . .	478226	414470	490168	420913	2618934	2260955	38037	22997	3625365	3119335

TABLE B.—COAL TRADE BY COUNTIES.

	CUMBERLAND.	PICOTU.	CAPE BRETON.	OTHER COUNTIES.	TOTAL.
Nova Scotia :					
By Land .....	111277	212283	158800	2780	485140
By Sea .....	.....	29963	472335	11376	513674
Total .....	111277	242246	631135	14156	998814
New Brunswick .....	234866	53936	60571	621	349994
Newfoundland .....	.....	12	102961	2647	105620
Prince Edward Island .....	.....	21476	28336	3961	53773
Quebec .....	56780	103243	855411	1612	1017046
West Indies .....	.....	.....	.....	.....	.....
United States .....	11547	.....	578539	.....	590086
Other Counties .....	.....	.....	4002	.....	4002
Total .....	414470	420913	2260955	22997	3119335

*Statement of Persons Employed in each Coal Mine during the year ended September 30th, 1901.*

COLLIERY.	UNDERGROUND.				ABOVE GROUND.				CONSTRUCTION.				TOTAL.		HORSES.		Pits Worked.
	Skilled Labor.	Labors.	Boys.	Days' Labor.	Skilled Labor.	Labors.	Boys.	Days' Labor.	Skilled Labor.	Labors.	Boys.	Days' Labor.	Persons.	Days' Labor.	Above.	Below.	
Joggins.....	72	99	18	44269	6	71	9	20895	.....	.....	.....	.....	278	65164	4	8	235
Springhill.....	503	411	134	234123	106	209	43	77212	.....	.....	.....	.....	1406	311335	21	44	225
Acadia.....	252	286	62	143652	60	164	33	70437	.....	.....	.....	.....	857	214089	17	32	279
International.....	221	155	97	116645	45	98	26	48054	1	2	.....	761	615	165460	12	26	272
†N. S. S. & C. Co.....	4	7	.....	859	2	17	.....	6677	.....	.....	.....	.....	30	7536	.....	.....	.....
Dominion.....	1114	1402	180	770871	251	456	65	226723	7	.....	.....	1284	3475	1001878	40	312	300
†N. S. S. & C. Co.....	301	81	80	136020	80	127	32	68726	.....	.....	.....	.....	701	204746	10	55	295
Sydney Coal Co.....	22	11	.....	7017	.....	4	.....	1923	.....	.....	.....	.....	39	8940	.....	.....	238
Port Hood.....	32	49	4	15816	3	34	2	8712	45	.....	.....	7560	169	32088	5	3	290
New Campbellton.....	21	15	5	11984	3	5	2	3090	.....	.....	.....	.....	51	15074	2	.....	299
Mabou.....	3	3	.....	365	2	2	.....	137	16	.....	.....	216	12	718	.....	.....	90
Total.....	2545	2519	580	1481721	563	1187	212	535586	55	2	.....	9821	7063	2027028	112	480	2518

†Pictou Co. †Sydney Mines.



## MINES REPORT.

xv

*Nova Scotia Coal Sales, 1785 to 1901 (inclusive.)*

Year.	Sales.	Total.	Year.	Sales.	Total.	
1785	1,668	14,349	1841	148,298	Forw'd 1,208,150	
1786	2,000		1842	129,708		
1787	10,681		1843	105,161		
1788			1844	108,482		
1789			1845	150,674		
1790			1846	147,506		
1791	2,670		1847	201,650		1,533,798
1792	2,143		1848	187,643		
1793	1,926		1849	174,592		
1794	4,405		1850	180,084		
1795	5,320	1851	153,499			
1796	5,249	1852	188,076			
1797	6,039	1853	217,416			
1798	5,948	1854	234,812			
1799	8,947	1855	238,215			
1800	8,401	1856	253,492	2,399,319		
1801	5,755	1857	294,198			
1802	7,769	1858	226,725			
1803	6,601	1859	270,293			
1804	5,976	1860	322,593			
1805	10,130	1861	326,429			
1806	4,938	1862	395,637			
1807	5,119	1863	429,351			
1808	6,616	1864	576,935			
1809	8,919	1865	635,186			
1810	8,609	1866	558,520	4,927,339		
1811	8,516	1867	471,185			
1812	9,570	1868	453,624			
1813	9,744	1869	511,795			
1814	9,866	1870	568,277			
1815	9,336	1871	596,418			
1816	8,619	1872	785,914			
1817	9,284	1873	811,106			
1818	7,920	1874	749,127			
1819	8,692	1875	706,795			
1820	9,930	1876	634,207	7,317,430		
1821	11,338	1877	697,665			
1822	7,512	1878	693,511			
1823	27,000	1879	658,628			
1824		1880	954,659			
1825		1881	1,035,014			
1826	12,600	1882	1,250,179			
1827	12,149	1883	1,297,523			
1828	20,967	1884	1,261,650			
1829	21,935	1885	1,254,510			
1830	27,269	1886	1,373,666			
1831	37,170	1887	1,519,684	13,910,136		
1832	50,349	1888	1,576,692			
1833	61,743	1889	1,755,107			
1834	50,813	1890	1,786,111			
1835	56,134	1891	1,849,945			
1836	107,593	1892	1,752,934			
1837	118,942	1893	1,485,914			
1838	106,730	1894	2,019,742			
1839	145,962	1895	1,831,357			
1840	101,195	1896	2,947,133			
		1897	2,013,421	20,552,536		
		1898	2,135,397			
		1899	2,419,137			
		1900	2,997,546			
		1901	3,119,335			
			Total.....	51,908,043		

## SUMMARY.

1785 to 1790 .....	14,349	1841 to 1850 .....	1,533,798
1791 to 1800 .....	51,048	1851 to 1860 .....	2, 89,319
1801 to 1810 .....	70,452	1861 to 1870 .....	4 927,339
1811 to 1820 .....	91,527	1871 to 1880 .....	7,317,430
1821 to 1830 .....	140,820	1881 to 1890 .....	13,910,136
1831 to 1840 .....	839,954	1891 to 1900 .....	20,552,536

\*Nine months only. Fiscal year begins Oct. 1 and ends Sept. 30. (Chap. 4, Acts 1893)

## COAL.

## NOVA SCOTIA EXPORTED TO THE UNITED STATES.

Years.	Tons.	Duty.	Years.	Tons.	Duty.
1850	118173	24 ad.	1876	71634	75
1851	116274	"	1877	118216	"
1852	87542	"	1878	88495	"
1853	120764	"	1879	51641	"
1854	139125	Free.	1880	123423	"
1855	103222	"	1881	113728	"
1856	126152	"	1882	99302	"
1857	123335	"	1883	102755	"
1858	186743	"	1884	64515	"
1859	122720	"	1885	34483	"
1860	149289	"	1886	66003	"
1861	204457	"	1887	73892	"
1862	192612	"	1888	30198	"
1863	282775	"	1889	29986	"
1864	347594	"	1890	50854	"
1865	465194	"	1891	25431	"
1866	404252	"	1892	13883	"
1867	338492	\$1.25	1893	16099	"
1868	228132	"	*1894	79837	40
1869	257485	"	+1895	73097	"
1870	168180	"	+1896	174919	"
1871	165431	"	1897	106279	"
1872	154092	75	1898	98027	"
1873	254760	"	1899	153188	"
1874	138336	"	1900	624273	"
1875	89746	"	1901	590086	"

NOTE.—The quantities given for the years 1852 to 1872 are on the authority of the Board of Trade, Philadelphia, and are probably under-estimated.

\*Nine months only.

†NOTE.—After August 1st, 1894, duty on Round Coal 40 cents, on Culm or Slack 15, cents.

‡Fiscal year begins October 1st, and ends September 30th. (Cap. 4, Acts 1893).

GENERAL GOLD STATEMENT.  
Year ending September 30th, 1901.

DISTRICT.	Tons Crushed.	TOTAL YIELD OF GOLD.			AVERAGE YIELD OF GOLD PER TON.		
		Oz.	Dwt.	Gr.	Oz.	Dwt.	Gr.
Stormont.....	30228	5139	17	.....	.....	3	10
Sherbrooke.....	16503	3114	6	21	.....	3	18
Renfrew .....	751	3358	5	6	4	9	10
Wine Harbor .....	4196	1362	4	12	.....	6	12
North Brookfield.....	7709	3253	10	.....	.....	8	11
Waverly .....	8908	2903	4	14	.....	6	12
Leipsigate .....	819	423	12	5	.....	10	8
Harrigan Cove .....	3071	2628	9	.....	.....	17	3
Caribou .....	6893	2341	5	6	.....	6	19
Oldham .....	779	439	11	16	.....	11	5
Lake Catcha.....	1779	969	16	21	.....	10	20
Blockhouse .....	465	808	.....	.....	1	14	18
Montagne .....	595	437	15	2	.....	14	17
Uniacke .....	748	874	9	.....	1	3	9
Mills' Village .....	1057	742	.....	.....	.....	14	1
Tangier .....	936	436	10	.....	.....	9	8
Malaga.....	173	226	17	.....	1	6	5
Other Districts.....	2382	1077	9	17	.....	9	1
Total .....	87992	30537	4	0	.....	6	22

## PRODUCTION OF GOLD FROM 1862 TO 1901.

District.	Tons Crushed.	TOTAL YIELD OF GOLD.				AVERAGE YIELD OF GOLD PER TON.				VALUE AT \$19.00 PER OZ.
		Oz.		Gr.		Oz.		Gr.		
		Oz.	Dwt.	Gr.	Dwt.	Oz.	Dwt.	Gr.		
Caribou and Moose River .....	132649	44432	12	.....	.....	6	17	844220		
Montague .....	26890	41149	14	14	1	10	13	781845		
Oldham .....	49224	52948	2	16	.....	1	13	1006016		
Renfrew .....	49352	41675	9	6	.....	16	21	791891		
Sherbrooke .....	244187	141896	3	6	.....	11	14	2696027		
Stromont .....	208909	72596	13	3	.....	6	23	1379337		
Tangier .....	47874	23268	4	15	.....	9	17	442097		
Unacke .....	55298	39476	15	2	.....	14	7	750059		
Waverley .....	135428	64960	12	9	.....	9	14	1234252		
Brookfield .....	51684	24353	7	22	.....	9	10	462715		
Salmon River .....	117175	41487	5	20	.....	7	2	788259		
Whiteburn .....	6394	9554	17	18	1	9	21	181544		
Lake Catcha .....	24857	25146	5	2	1	0	6	477779		
Rawdon .....	12178	9594	15	10	.....	15	18	182302		
Wine Harbour .....	54586	28829	12	14	.....	10	14	547764		
Fifteen Mile Stream .....	32893	16403	9	5	.....	9	23	311666		
Malaga .....	20590	18910	12	7	.....	18	9	359302		
Other Districts .....	88696	54577	15	22	.....	12	7	1036979		
Total .....	1358864	751265	18	23	.....	11	1	14274054		

## MONTHLY STATEMENT FOR EACH GOLD DISTRICT.

MONTH.	STORMONT.				SHERBROOKE.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October .....	3	2765	396	10 .....	1	600	190	....
November .....	3	3226	596	11 .....	2	1596	236	....
December .....	2	2580	380	....	3	1683	319	....
January ....	2	2112	292	18 .....	2	1645	333	....
February ....	1	1766	230	....	2	1400	341	....
March .....	3	2716	428	11 .....	2	1156	331	....
April .....	2	2675	385	....	1	963	272	....
May .....	3	2735	498	3 .....	2	1599	281	....
June .....	3	2122	344	10 .....	2	1708	203	....
July .....	3	2539	401	19 .....	2	1413	251	....
August .....	3	2498	569	....	1	1290	190	....
September .....	2	2494	616	15 .....	1	1450	165	....
Total .....	.....	30228	5139	17 .....	.....	16503	3114	6 21



## MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(Continued.)

MONTH.	RENFREW.				WINE HARBOR.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October .....	2	150	733	4 6	2	485	182	10
November .....	1	50	85	.....	2	553	175	18
December .....	2	110	1121	.....	2	428	163	8
January .....	.....	.....	.....	.....	2	420	164	15
February .....	1	55	709	.....	2	440	121	2 12
March .....	1	206	371	18	2	500	138	14
April .....	1	120	291	.....	1	240	12	11
May .....	.....	.....	.....	.....	1	260	112	.....
June .....	.....	.....	.....	.....	1	280	83	6
July .....	.....	.....	.....	.....	1	290	93	.....
August .....	1	60	47	3	1	300	115	.....
September .....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	751	3358	5	6	4196	1362	4	12

## MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(Continued.)

MONTH.	LEIPSIGATE.				HARRIGAN COVE.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October.....	1	50	30	5	1	264	185	....
November.....	.....	.....	....	....	1	227	201	9
December.....	1	52	31	15	1	196	202	5
January.....	.....	.....	....	....	2	265	231	14
February.....	1	95	40	5	1	217	245	2
March.....	.....	.....	....	....	2	200	195	....
April.....	.....	.....	....	....	2	312	240	17
May.....	.....	.....	....	....	2	312	234	3
June.....	1	76	43	14	1	246	252	....
July.....	1	180	103	....	2	316	240	10
August.....	1	151	75	3	1	234	233	9
September.....	1	215	99	10	1	282	167	....
Total.....	.....	819	423	12	5	3071	2628	9



## MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(Continued.)

MONTH.	CARIBOU.				OLDHAM.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October . . . . .	5	526	169	3 18	2	121	54	9 22
November . . . . .	4	730	250	6	2	114	79	15 3
December . . . . .	4	951	370	18	2	98	50	18 8
January . . . . .	3	586	202	19	}	No Crushing.		
February . . . . .	1	213	99	8				
March . . . . .	2	774	254	10	}			
April . . . . .	2	489	187	3			36	14
May . . . . .	4	886	219	12 14	1	98	63	13
June . . . . .	4	777	219	19 4	2	68	47	15 15
July . . . . .	3	717	109	13 12	}			
August . . . . .	2	125	11				52	7 16
September . . . . .	2	119	246	12 6	1	64	53	18
Total . . . . .		6893	2341	5 6		779	439	11 16

## MONTHLY STATEMENT OF EACH GOLD DISTRICT.—(Continued.)

MONTH.	LAKE CATCHIA.				BLOCKHOUSE.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October .....	1	79	85	9	.....	.....	.....	.....
November .....	1	112	63	10	.....	.....	.....	.....
December .....	1	70	32	10	.....	.....	.....	.....
January .....	3	115	59	17	.....	.....	.....	.....
February .....	2	160	114	14	.....	.....	.....	.....
March .....	2	189	102	15	.....	230	463	.....
April .....	2	130	95	17	.....	.....	.....	.....
May .....	2	184	78	11	.....	.....	.....	.....
June .....	2	211	92	12	.....	.....	.....	.....
July .....	2	162	82	4	.....	.....	.....	.....
August .....	2	189	85	5	.....	.....	.....	.....
September .....	2	178	76	11	.....	.....	.....	.....
Total .....	.....	1779	969	16	.....	465	808	.....



## MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(Continued.)

MONTH.	MONTAGUE.				UNSHACK.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons. Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October.....		165	54	.... 17	1	Not Given	96	16 ....
November.....		79	32	.... 9 12	.....	.....	...	....
December.....		64	99	15 6	1	40	51	10 ....
January.....		.....	1	19 ....	1	80	94	4 ....
February.....		14	7	.... 12	1	85	113	12 ....
March.....		60	52	12 ....	2	181	208	7 ....
April.....		36	72	16 ....	.....	.....	...	....
May.....		62	21	4 12	2	88	64	16 ....
June.....		41	48	....	.....	.....	...	....
July.....		25	10	12 ....	2	248	170	12 ....
August.....		7	9	15 15	.....	.....	...	....
September.....		42	27	10 ....	1	26	74	12 ....
Total.....		595	437	15 2	.....	748	874	9

Chiefly Tributaries.

## MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(Continued.)

MONTH.	MILL VILLAGE.				TANGIER.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed.	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October .....	1	104	54	....	1	400	235	5
November .....	1	98	52	....	....	....	....	....
December .....	1	103	116	....	....	....	....	....
January .....	1	118	96	....	....	....	....	....
February .....	1	114	60	....	....	....	....	....
March .....	1	104	60	....	....	....	....	....
April .....	1	142	75	....	....	....	....	....
May .....	1	109	140	....	....	....	....	....
June .....	1	63	37	....	1	143	72	10
July .....	1	52	29	....	1	208	88	5
August .....	1	50	23	....	....	....	....	....
September .....	....	....	....	....	1	185	40	10
Total .....	1057	742	....	....	936	436	10	....

## MONTHLY STATEMENT OF EACH GOLD DISTRICT.—(Continued.)

MONTH.	MALAGA.				OTHER DISTRICTS.			
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.		No. of Mines.	Tons Crushed	YIELD OF GOLD.	
			Oz.	Dwt. Grs.			Oz.	Dwt. Grs.
October .....	.....	.....	....	....	7	1306	230	18 5
November .....	.....	.....	....	....	5	192	54	8 20
December .....	.....	.....	....	....	5	324	78	18 13
January .....	.....	.....	....	....	1	15	13	3 8
February .....	.....	.....	....	....	2	95	42	4 23
March .....	.....	.....	....	....	1	19	7	....
April .....	1	15	30	16	1	7	12	19 18
May .....	1	13	12	15	1	20	2	....
June .....	1	57	80	5	2	7	4	19 5
July .....	1	29	15	....	4	59	45	17 21
August .....	1	38	55	5	1	160	52	5 ....
September .....	1	21	32	16	3	178	532	14 ....
Total .....	.....	173	226	17	.....	2382	1077	9 17

## INTERCOLONIAL RAILWAY.

*Statement showing the various kinds of Coal (in tons) received from the different Mines in Nova Scotia for the use of the Intercolonial Railway, from the 1st of October, 1900, to 30th September, 1901.*

MONTH.	Consolidated Scotia Company, (Geo. J. Harrison.)		River Hebert Coal Co., R. S. Hibbard		Canada Coals and Railway Co., (Joggins.)		Cumberland Railway and Coal Company, (Springhill.)				Acadia Coal Co. Acadia, Albion and Vale.		Inter- colonial Coal Co. Drum- mond.	Do- minion Coal Co Cape Breton.	Nova Scotia Steel & Coal Co. G. M. A.	Port Hood Coal Co.	Broad Cove Mines, I. and R. Ry.	Mic- Mac Mining Co.	
	Round.	Slack.	Round.	Slack.	Round.	Run of Mine.	Slack.	Round.	Run of Mine.	Slack.	Round.	Blacksmith.	Coke.	Round.	473	Round.	Round.		
1900.																			
October ..	.....	.....	20	.....	3031	416	.....	6159	6067	401	20	4818	124	1787	3236	473	.....	.....	
November ..	41	.....	180	19	2662	17	.....	3995	7632	.....	29	4546	56	2146	2680	482	.....	.....	
December ..	.....	.....	131	24	2312	125	.....	10582	2585	58	.....	5089	116	3522	4203	1568	40	.....	
1901.																			
January ..	34	.....	211	.....	3766	217	.....	11857	263	.....	.....	5785	39	3648	4877	608	.....	.....	
February ..	113	.....	356	56	1521	.....	.....	9358	.....	.....	.....	4579	162	2934	4043	740	30	.....	
March ..	262	.....	631	.....	3492	43	.....	8706	720	.....	.....	4783	81	2766	5648	720	204	.....	
April ..	247	21	349	.....	3932	.....	.....	12572	.....	.....	.....	6082	43	6105	5953	347	.....	.....	
May ..	107	.....	513	40	3434	.....	.....	12206	.....	.....	.....	11185	82	4034	6173	164	.....	.....	
June ..	103	.....	592	60	2900	.....	201	11171	19	.....	.....	8155	94	5937	11497	66	.....	41	
July ..	.....	.....	.....	.....	.....	84	.....	84	.....	.....	.....	1584	64	100	3862	.....	.....	.....	
August ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1457	15	10992	18	.....	119	.....	
September.	.....	.....	668	.....	877	.....	.....	8957	.....	.....	.....	5316	58	1423	5925	20	.....	.....	
	907	21	3651	199	27927	818	201	96647	16566	459	49	63379	934	24	69089	5206	274	119	41

## INTERCOLONIAL RAILWAY.

*Statement showing the number of Tons of Coal received at the following Stations from Mines in Nova Scotia during year ended 30th September, 1901.*

Destination.	Tons.	Destination.	Tons.
Halifax .....	62,396	<i>Brought forward</i> ..	307,476
Dartmouth .....	29,408	Bayfield Road .....	46
Waverley .....	532	Tracadie .....	34
Bedford .....	809	Harbour au Bouche ..	116
Windsor Junction....	17,325	Mulgrave .....	708
Wellington .....	21	Hastings .....	7
Enfield .....	135	Point Tupper .....	255
Elmsdale .....	597	McIntyres Lake ....	26
Milford .....	48	Orangedale .....	216
Shubenacadie .....	317	Iona .....	41
Stewiacke .....	678	Grand Narrows .....	219
Brookfield .....	169	North Sydney .....	122
Truro .....	12,629	Sydney .....	130
Valley .....	7	Belmont .....	7
West River .....	34	BeBert .....	7
Glengarry .....	42	East Mines .....	51
Hopewell .....	1,326	Londonderry .....	1,768
Ferrona Junction....	71,887	Thomson .....	8
Stellarton .....	9,604	Oxford .....	792
Sylvester's .....	562	Pugwash Junction...	447
New Glasgow .....	7,368	Pugwash .....	1,268
Trenton .....	58,917	Wallace Bridge .....	12
Pictou Landing .....	29,589	Wallace .....	432
Merigomish .....	136	Malagash .....	89
Avondale .....	49	Tatamagouche .....	475
Antigonish .....	2,825	Denmark .....	65
South River .....	18	River John .....	439
Pomquet .....	20	Meadowville .....	24
Heatherton .....	28	Scotsburn .....	319
<i>Carried forward</i> ..	307,476	<i>Carried forward</i> ..	315,599



## INTERCOLONIAL RAILWAY—(Continued.)

Destination.	Tons.	Destination.	Tons.
<i>Brought forward</i> ..	315,599	<i>Brought forward</i> ..	435,163
Pictou.....	10,992	Charlo .....	19
Spring Hill Junction.	21	Cold Brook .....	806
Nappan .....	22	Dalhousie Junction..	44
Amherst .....	14,759	Dalhousie .....	38
Aulac .....	230	Campbellton.....	113
Sackville .....	4,136	Metapedia.....	2,570
Dorchester.....	1,417	Amqui.....	28
College Bridge .....	14	Cedar Hall.....	18
Memramcook .....	395	St. Amablet.....	30
Pansec Junction .....	7	Bic.....	11
Shediac .....	826	Riviere du Loup ....	4,029
Point du Chene.....	95	St. Paschal .....	43
Moncton .....	14,246	St. Henri Junction ..	20,612
Salisbury .....	2,449	Chaudiere Junction..	16
Petitcodiac .....	441	Levis.....	1,108
Penobsquis .....	15	Kingsburg Junction .	223
Sussex .....	885	St. Hyacinthe .....	134
Norton .....	42	St. Madeline.....	56
Hampton .....	2,210	Beloeil .....	115
Nauwigewauk .....	7	St. Lambert .....	85
Rothesay .....	70	Montreal .....	27,316
St. John.....	59,932	G.T.R. via Chaudiere.	1,170
Kent Junction .....	764	“ “ Ste. Rosaile.	34
Rogersville .....	47	C. P. R. “ “	132
Chatham Junction...	10,735		
Millerton .....	143	Total .....	493,913
Derby Junction.....	17		
New Castle.....	45		
Gloucester Junction..	1,504		
Bathurst .....	64		
New Mills.....	34		
<i>Carried forward</i> ..	435,163		
		SUMMARY.	
		FROM.	TONS.
		Stellarton .....	198,659
		Westville .....	22,213
		New Glasgow .....	23,180
		Albion .....	24,306
		North Sydney .....	57,901
		Sydney .....	10,143
		Springhill .....	134,036
		Maccan .....	23,375
		Total .....	493,913

## CUSTOMS CANADIAN.

PORT OF WINDSOR, N. S., 1901.

*Memo Exports of the Mine and Quarry from the Port of Windsor, including  
Outports from 30th September, 1900, to 30th September, 1901.*

	TONS.	VALUE.
Gypsum.....	128,637	\$119,278 00
Moulding Sand.....	320	1,280 00
Manganese .....	5	400 00





